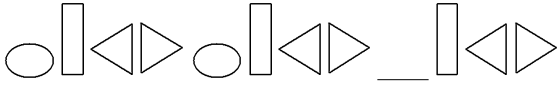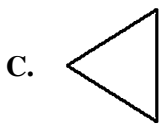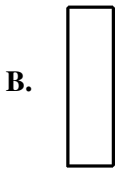1. Sam didn't finish his picture in art.

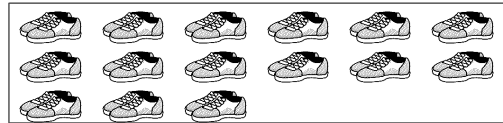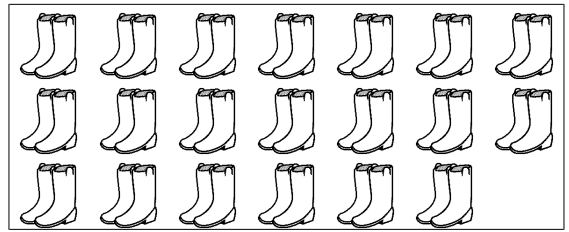Which shape is missing in his pattern?

A.

B.

C.

2. Joshua and his brothers were playing at the beach. Joshua put sand on his 10 toes. Finish the table to find out how many toes were in the sand when all 3 boys covered their toes.

boys	1	2	3
toes	10		

A. 20   **B.** 25   **C.** 30

3. Eilene counted pairs of shoes at the beach.
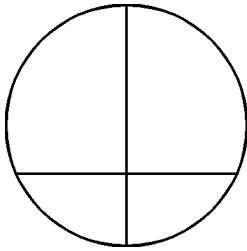

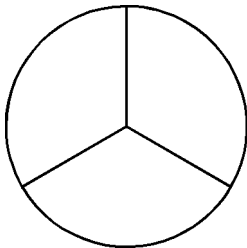Which type of shoe has the *least* number?

A.   **B.**   **C.**

4. Rodney and his family ordered some pizzas for a party. Which pizza is cut into equal parts?

A.

B.

C.
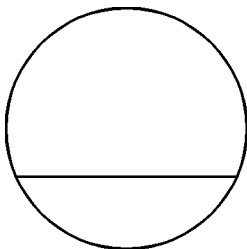
D.
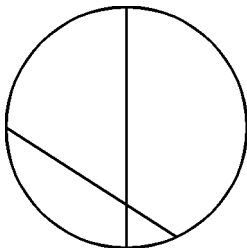
5. Ten dogs are playing. Four run away. How many dogs now?
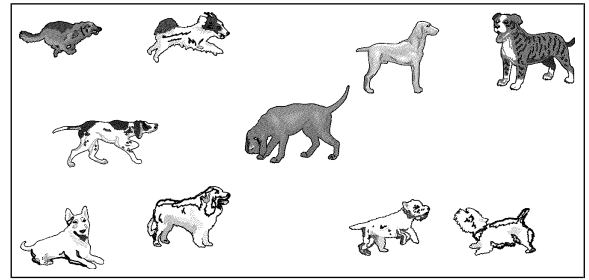
A. $10 + 4 = 14$ B. $4 + 6 = 10$

C. $10 - 4 = 6$ D. $14 - 4 = 10$

6. Robert made a new shape. How many triangles are in his shape?
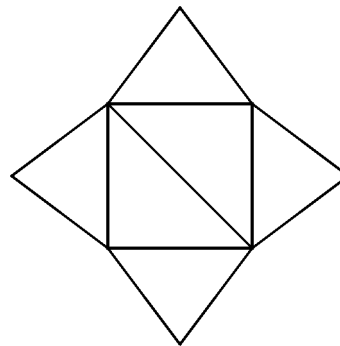
A. 2   B. 4   C. 6

7. Freddie raised his hand.

   Freddie is—

   A. in back

   B. in the middle

   C. in front

8. Amy eats dinner between 6:00 and 7:00. Which clock shows a time between 6:00 and 7:00?

   A.

   B.

   C.

   D.
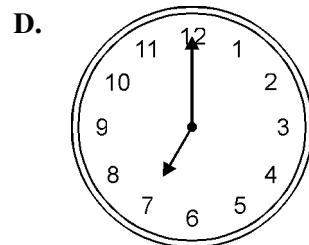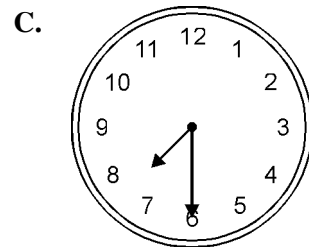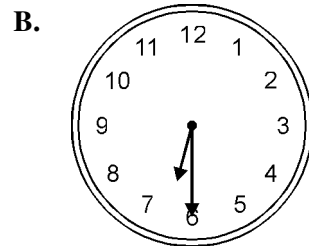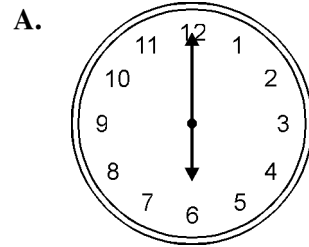
9. Zachary was playing a game. His dad said he could play until the hour hand was on the 8 and the minute hand was on the 12. What time did he stop? Use the clock to help.
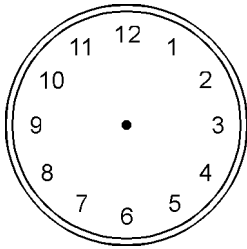
A. 12:30   **B.** 12:00   **C.** 8:00

10. Dan has a coin in his pocket that has a value of 25¢. Which coin is it?

A.

B.

C.
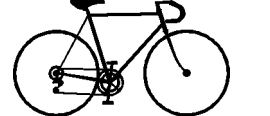
11. The graph shows how the students in Allen's class get to school.

Getting to School
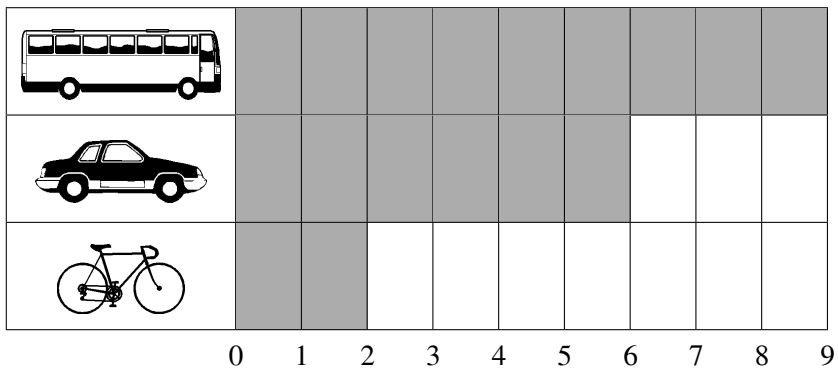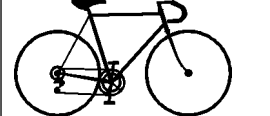
Which table matches the graph?
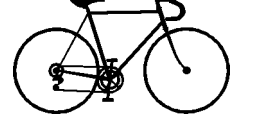
A.
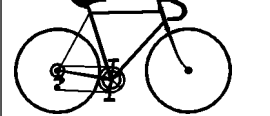
B.

C.

D.

12. The graph shows the apples picked.

Apples Picked	
Jim	🍎 🍎 🍎 🍎
Jeff	🍎 🍎 🍎 🍎 🍎 🍎
Jerry	🍎 🍎 🍎 🍎 🍎 🍎 🍎 🍎
Mike	🍎 🍎 🍎 🍎 🍎 🍎 🍎 🍎 🍎 🍎
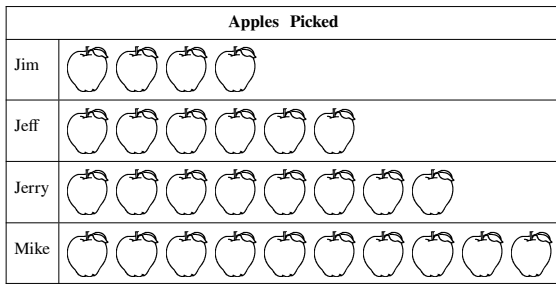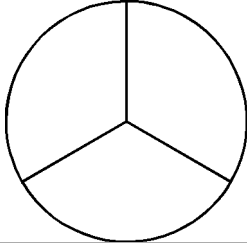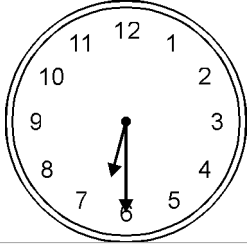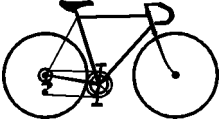
Each 🍎 means 1 apple.

How many more apples did Jeff pick than Jim?

A. 0   **B.** 1   **C.** 2

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Grade 1

Num	Scoring	Standard	Answer
1	A	1-1.1	
2	C	1-1.2	30
3	C	1-2.1b	
4	B	1-2.1d	
5	C	1-2.2b	$10 - 4 = 6$
6	C	1-3.2	6
7	C	1-3.4	in front
8	B	1-4.2a	
9	C	1-4.2a	8:00
10	B	1-4.3	
11	D	1-5.1a	
12	C	1-5.1a	2

1. Sam rode her tricycle around the block. It has 3 wheels on it. How many wheels would 6 tricycles have?

Number of Tricycles	Number of Wheels
1	3
2	6
3	
4	
5	
6	

2. Emily has 5 fish. Beth gave Emily 2 fish. Maria gave Emily 3 fish. How many fish does Emily have in all?

   A. 8 fish   **B.** 25 fish

   C. 10 fish   **D.** 7 fish

3. Mrs. Joseph has 379 books and 324 magazines. Does she have more books or magazines? Show your answer with base 10 blocks.

4. Macy drew a picture and shaded $\frac{1}{4}$ of it to show that she ate $\frac{1}{4}$ of the brownies. Which picture is Macy's?

   A.

   B.

   C.

   D.
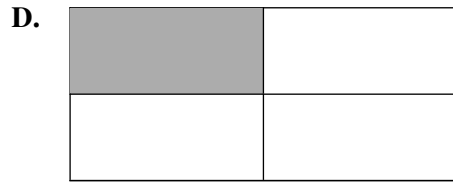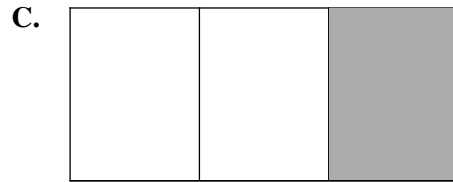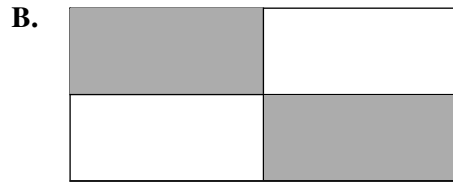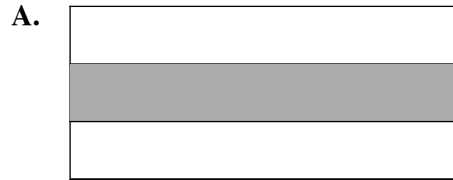
5. Boots has 3 bones in his doghouse. He also has 8 bones near his toys. Boots has 2 dog snacks in his doghouse. How many bones does Boots have?

   A. 5 bones   **B.** 10 bones

   C. 11 bones   **D.** 13 bones

6. Liz needed 16 sticks for the fire. Terri found eight sticks. How many sticks were left to find?

   A. 29 sticks   **B.** 23 sticks

   C. 8 sticks   **D.** 13 sticks
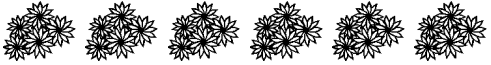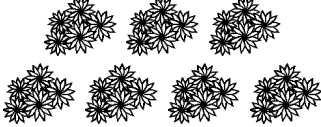
7.
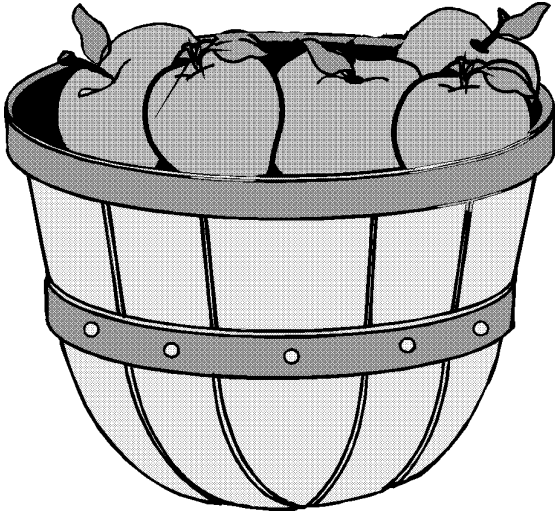
About how many apples are in the basket?

   A. 6 apples   **B.** 20 apples

   C. 80 apples   **D.** 800 apples

8. Angela had 6 bouquets of flowers that had 5 flowers each. Which shows how many flowers Angela had?

   A.

   B.

   C.

   D.

9. Mr. McGraw grows 3 kinds of trees in his orchard. He has 4 rows of peach trees with 6 trees in each row. Which number sentence shows the total number of peach trees in Mr. McGraw's orchard?

   A. $4 \times 6 = \square$ **B.** $6 - 4 = \square$

   C. $3 + 4 + 6 = \square$ **D.** $4 + 6 - 3 = \square$

10. How much would each small block need to weigh in order to balance the scale?
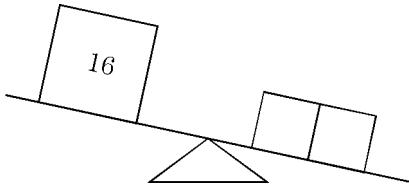
A. 2   **B.** 4   **C.** 6   **D.** 8

11. Sergio wanted to measure the length of his fence in his backyard. Which is the best unit for him to use?

   A. gallon   **B.** inches

   C. pounds   **D.** yards

12. Vicki likes to watch her favorite television show every Saturday at 8:00. Her show ends 1 hour later. Which clock shows the time her show is over?

A.
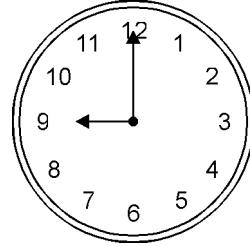
B.
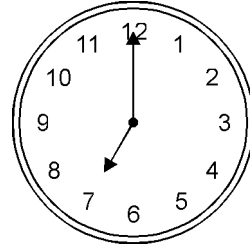
C.
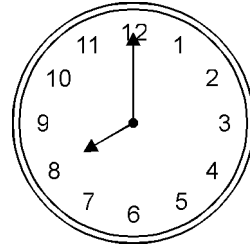
D.
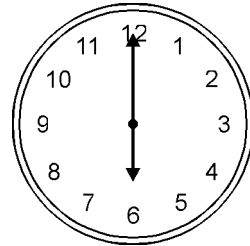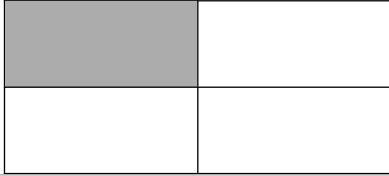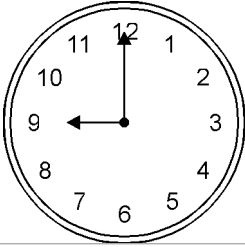
13. Mario has these coins in his pocket.

He wants to buy a toy car that cost 42¢. Does he have enough money? How do you know?

Grade 2

Num	Scoring	Standard	Answer
1		2-1.2	18
2	C	2-1.4	10 fish
3		2-2.1a	books
4	D	2-2.1d	
5	C	2-2.2a	11 bones
6	C	2-2.2a	8 sticks
7	B	2-2.2b	20 apples
8	B	2-2.2d	
9	A	2-2.2d	$4 \times 6 = \square$
10	D	2-2.2d	8
11	D	2-4.1b	yards
12	A	2-4.2a	
13		2-4.3a	No because he only has 33 cents

1. What is the missing number in the number pattern?

   5, 13, 21, 29, ☐, . . .

   A. 36   **B.** 37   **C.** 39   **D.** 43

2. Which number will complete the number sentence?

   23 − ☐ = ☐ + 5

   A. 10   **B.** 9   **C.** 5   **D.** 2

3. The chart shows the number of pies made in one month by 4 different bakers.

Baker	Pies
Joan	269
Christophe	198
Diego	291
Marcella	242

   Which lists the numbers of pies from *least* to *greatest*?

   A. 242, 269, 291, 198

   B. 198, 242, 291, 269

   C. 269, 198, 242, 291

   D. 198, 242, 269, 291

4. The models are shaded to show 2 fractions.
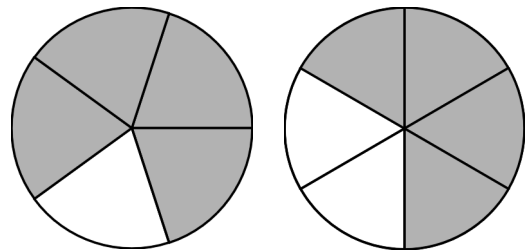
   The models show that—

   A. $\frac{4}{5} > \frac{4}{6}$ **B.** $\frac{1}{5} > \frac{2}{6}$

   C. $\frac{1}{5} = \frac{2}{6}$ **D.** $\frac{4}{5} = \frac{4}{6}$

5. Mayra bought 5 boxes of pencils. Each box had 3 pencils. How many pencils did Mayra buy?

   A. 2 **B.** 8 **C.** 15 **D.** 53

6. The stop sign shown has the shape of a(n) ____ .

   A. square

   B. pentagon

   C. hexagon

   D. octagon

7. How many *faces* does this pyramid have?

   A. 4 **B.** 5 **C.** 6 **D.** 8
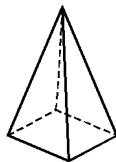
8.
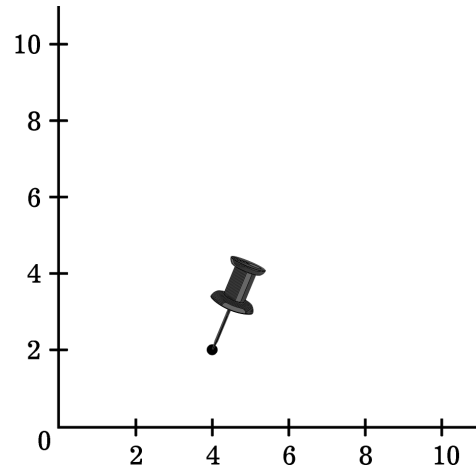
Where is the pin point on the grid?

   A. $(4, 6)$ **B.** $(4, 2)$

   C. $(2, 4)$ **D.** $(6, 4)$

9. Tori recorded the time spent each day studying, then she made a graph.

Day	Time
Monday	1 hr.
Tuesday	2 hrs.
Wednesday	1.5 hrs.
Thursday	2 hrs.
Friday	3 hrs.
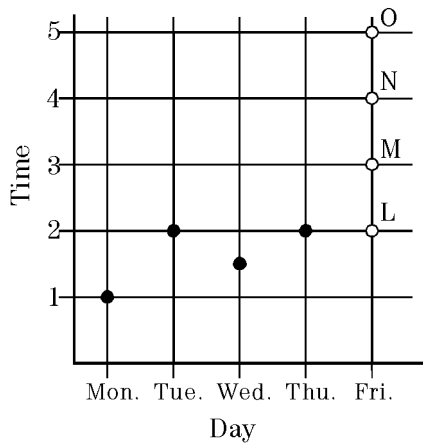
At which point on the graph should she plot Friday?

A. L   **B.** M   **C.** N   **D.** O

10. About how many cubes tall is the chair?
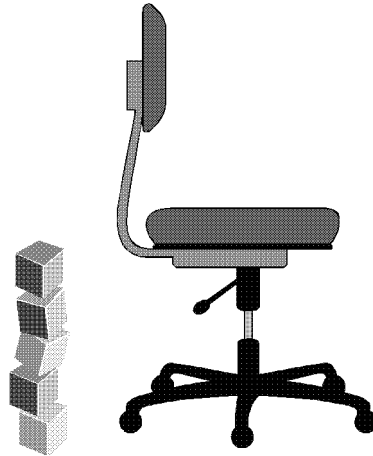
A. 1   **B.** 2   **C.** 10

11. Joanna went to the circus with some friends. She wrote a report for her class about what she saw at the circus. She made the graph to show some of the animals she saw. How many lions and tigers did Joanna see?

Circus Animals
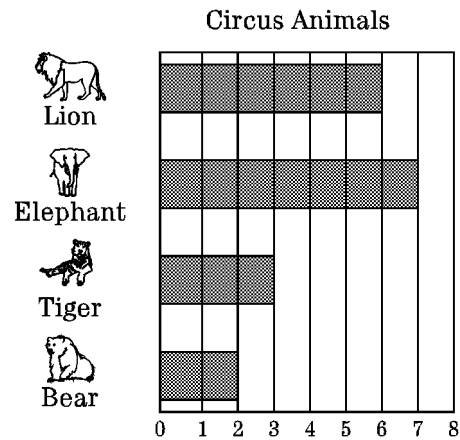
A. 13   **B.** 10   **C.** 9   **D.** 5

12. Washington Primary School collected aluminum cans for a recycling project. The chart shows the number of cans that each class collected.

Recycling Project

Kindergarten	200
1st Grade	150
2nd Grade	250
3rd Grade	350

Which graph matches the facts given in the chart?
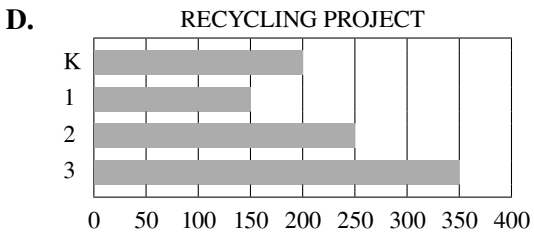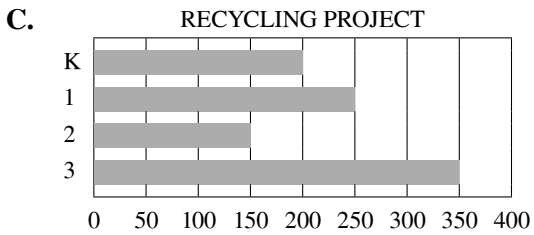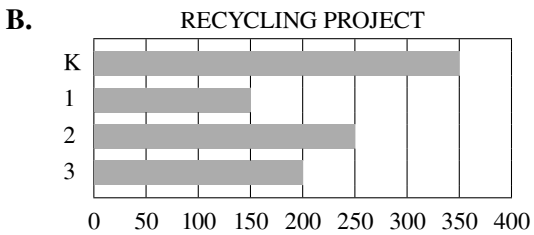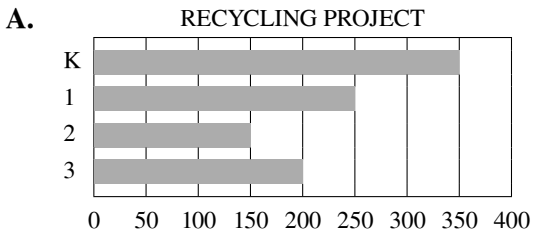
A.

RECYCLING PROJECT

K
1
2
3

0   50   100   150   200   250   300   350   400

B.

RECYCLING PROJECT

K
1
2
3

0   50   100   150   200   250   300   350   400

C.

RECYCLING PROJECT

K
1
2
3

0   50   100   150   200   250   300   350   400

D.

RECYCLING PROJECT

K
1
2
3

0   50   100   150   200   250   300   350   400

Grade 3

Num	Scoring	Standard	Answer
1	B	3-1.1	37
2	B	3-1.2	9
3	D	3-2.1b.i	198, 242, 269, 291
4	A	3-2.1b.ii	$\dfrac{4}{5} > \dfrac{4}{6}$
5	C	3-2.2b.i	15
6	D	3-3.1	octagon
7	B	3-3.1	5
8	B	3-3.3	$(4, 2)$
9	B	3-3.3	M
10	C	3-4.1d	10
11	C	3-5.1b	9
12	D	3-5.1c	RECYCLING PROJECT

1. Which of the following could be used to create the ordered pairs listed in columns A and B?

A	B
3	13
7	33
9	43
11	53

   A. Multiply the number in column A by 6, then subtract 5.

   B. Multiply the number in column A by 4, then add 5.

   C. Multiply the number in column A by 5, then subtract 2.

   D. Multiply the number in column A by 4, then add 1.

2. Dora and her family traveled by canoe down the Red River. The table shows some of the villages where they stopped to spend the night and the total distance traveled to reach each village.

   Stops Along the River

	Total Days	Total Miles (at end of day)
Jeb's Landing	2	10
Stony Point	7	35
The Willows	13	65

   After Day 20, the family stopped to spend the night at Mosquito Creek. If the pattern in the table continued, how many miles had the family traveled down the river?

   A. 120 mi **B.** 100 mi

   C. 85 mi **D.** 33 mi

3. "I am an odd number with 5 digits. My digit in the tens place is even. If the order of my digits is reversed, I am still the same number. What number can I be?"

   A. 32,623 **B.** 51,415

   C. 24,613 **D.** 30,663

4. What part of the hundredths boards is shaded?
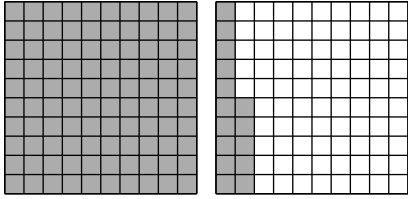
  A. 0.85   **B.** 1.05   **C.** 1.15   **D.** 1.85

5. What number belongs at point *A*?
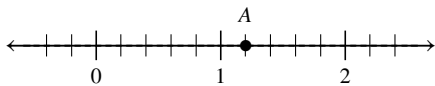
  A. $\dfrac{2}{10}$ **B.** $\dfrac{20}{100}$

  C. $1\dfrac{20}{100}$ **D.** $1\dfrac{2}{10}$

6. Mr. Suzuki bought 176 small boxes of fruit juice at the warehouse store. Each of the boxes held 9 ounces of juice. How many ounces of juice did Mr. Suzuki buy altogether?

  A. 1,496 oz   **B.** 1,584 oz

  C. 2,223 oz   **D.** 2,397 oz

7. Mr. Senick needs to make lunches for the club picnic. Each lunch needs 5 carrot sticks. Mr. Senick has 80 carrot sticks in a bag. How many lunches can he make using the entire bag?

  A. 12   **B.** 15   **C.** 16   **D.** 20

8.
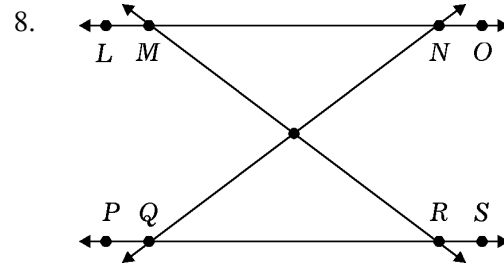
In the figure above, which lines appear to be parallel?

  A. $\overleftrightarrow{LO}$ and $\overleftrightarrow{PS}$ **B.** $\overleftrightarrow{MN}$ and $\overleftrightarrow{NQ}$

  C. $\overleftrightarrow{MR}$ and $\overleftrightarrow{NQ}$ **D.** $\overleftrightarrow{RS}$ and $\overleftrightarrow{TN}$

9. Which pair of figures shows a translation?

A.

B.

C.

D.
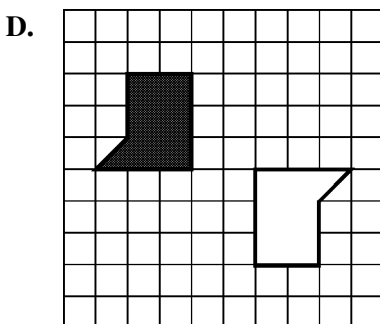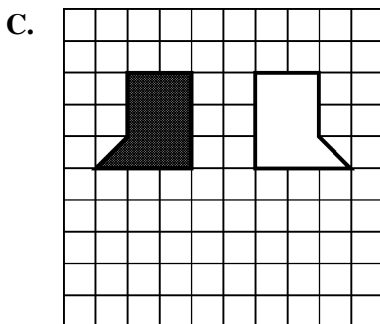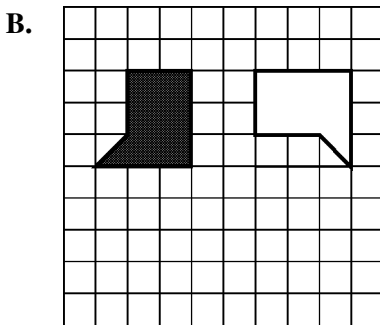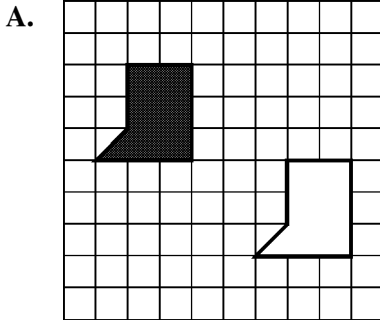
10. Which item below would have a mass of less than 5 grams?

A. a binder **B.** a television

C. a scissors **D.** a raisin

11. If the person standing on the scale lost 8 pounds, the arrow would point to which of the following?

A. 57 lbs **B.** 62 lbs

C. 73 lbs **D.** 78 lbs

12.
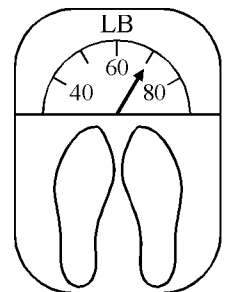
Which of the following has the same area as the figure above?

A.

B.

C.

D.
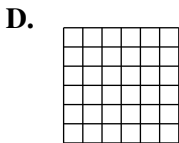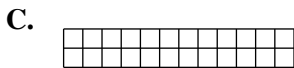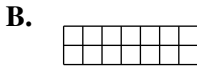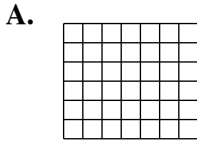
13. It is 12:50 pm. Your favorite show is on at 7:45 pm. How much time until your favorite show starts?

A. 7 hours 45 minutes

B. 7 hours 55 minutes

C. 6 hours 55 minutes

D. 5 hours 5 minutes

14. Ashton sells new scooters. He recorded on a graph the colors of the new scooters he sold last year.

Color of New Scooters
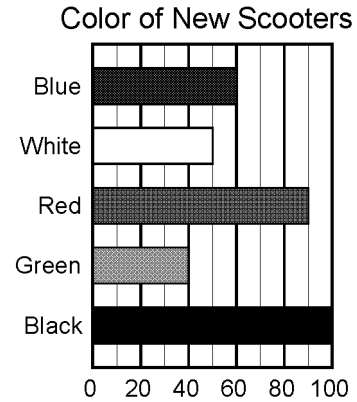
The total number of green scooters and black scooters that Ashton sold last year was the same as the total number of—

A. red scooters and green scooter

B. white scooters and red scooters

C. blue scooters and red scooters

D. white scooters and green scooters

15. Look at the spinner.
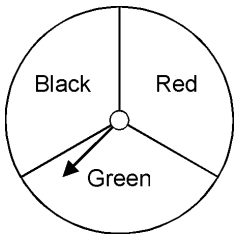
Which tally chart shows the most likely results of 30 spins?

A.

color	spin results
black	JHf
red	JHf JHf JHf IIII
green	JHf I

B.

color	spin results
black	JHf JHf
red	JHf IIII
green	JHf JHf I

C.

color	spin results
black	JHf JHf IIII
red	JHf JHf IIII
green	II
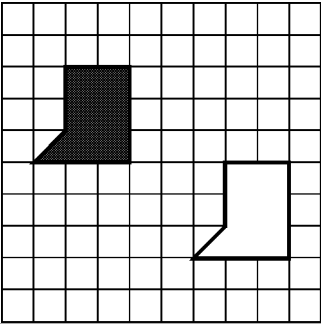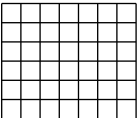
D.

color	spin results
black	JHf JHf JHf
red	JHf JHf
green	JHf

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Grade 4

Num	Scoring	Standard	Answer
1	C	4-1.1	Multiply the number in column A by 5, then subtract 2.
2	B	4-1.1	100 mi
3	A	4-2.1a.i	32,623
4	C	4-2.1a.ii	1.15
5	D	4-2.1b.ii	$1\frac{2}{10}$
6	B	4-2.2a	1,584 oz
7	C	4-2.2b3	16
8	A	4-3.1	$\overleftrightarrow{LO}$ and $\overleftrightarrow{PS}$
9	A	4-3.4	
10	D	4-4.1b	a raisin
11	B	4-4.1c	62 lbs
12	A	4-4.1d	
13	C	4-4.2a	6 hours 55 minutes
14	B	4-5.1a	white scooters and red scooters
15	B	4-5.2	color spin results black 卌 卌 red 卌 ‖‖ green 卌 卌 ‖

1. Which of these digital counters shows the number forty-three million, six hundred seventeen thousand, three hundred?

    A. | 4 | 3 | 6 | 1 | 7 | 0 | 0 | 3 |

    B. | 4 | 3 | 6 | 1 | 7 | 3 | 0 | 0 |

    C. | 4 | 3 | 1 | 7 | 6 | 3 | 0 | 0 |

    D. | 4 | 3 | 7 | 6 | 1 | 3 | 0 | 0 |

2. Three of the ten T-shirts have polka dots. How would you write that amount as a decimal?

    A. 10.3   **B.** 1.03   **C.** 0.3   **D.** 0.03

3. Tim is considering what gift to buy for his brother from the ads in the paper.

    Watch
    for $39.95

    Sweater
    for $34.99

    Shirt
    for $29.98

    Belt
    for $29.95

    Which list shows the order of the prices of the gifts in order from least to the greatest?

    A. Shirt, Belt, Sweater, Watch

    B. Shirt, Sweater, Watch, Belt

    C. Belt, Shirt, Watch, Sweater

    D. Belt, Shirt, Sweater, Watch

4. The table shows how much Lupita spent on ice cream each week.

Week	Cost
Week 1	$3.50
Week 2	$2.29
Week 3	$6.71
Week 4	$3.45

About how much did she spend altogether for the entire month?

A. $8.00 **B.** $16.00

C. $18.00 **D.** $20.00

5. Abe was mailing 4 packages to his grandmother. One package weighed 18.2 lb, another 15.6 lb, another 16 lb, and the last, 12.8 lb. How much did the packages weigh all together?

A. 56.8 lb **B.** 62.2 lb

C. 62.6 lb **D.** 64.0 lb

6. The maids in a motel used $3\frac{2}{3}$ gallons, $4\frac{1}{4}$ gallons, and $2\frac{1}{2}$ gallons of ammonia based cleaner this week. How much cleaner total was used this week?

A. $9\frac{4}{9}$ gallons **B.** $9\frac{5}{24}$ gallons

C. $10\frac{5}{12}$ gallons **D.** $11\frac{1}{12}$ gallons

7. Look at the figure.
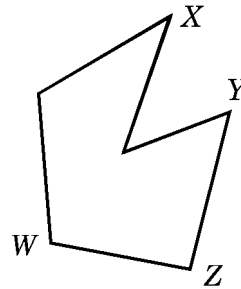
Which is the most reasonable description of angle *X*?

A. obtuse **B.** acute

C. right **D.** straight

8. In the figure shown, what is the measure of ∠BXC?
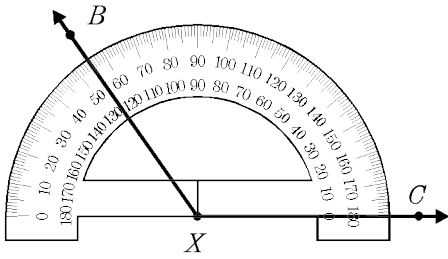
A. 65°   B. 90°   C. 125°   D. 150°

9. Marilyn drinks 2 pints of milk per day. Carl drinks 1 quart per day. Rudolpho drinks 5 cups per day, and Kim drinks 28 ounces per day. Who drinks the most milk per day?

   A. Carl   B. Kim

   C. Marilyn   D. Rodolpho

10. Each section on the spinner is the same size. What is the probability that the spinner will land on A?

   A. $\frac{1}{6}$ B. $\frac{1}{3}$

   C. $\frac{1}{2}$ D. $\frac{5}{6}$
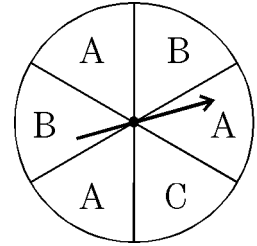
11. Julia has 2 quarters and 2 pennies in her pocket. If she pulls out two coins from her pocket without looking, what are all the possible outcomes for the types of coins she'll pull out?

   A. 2 quarters, 2 pennies, or 1 quarter and 1 penny

   B. 2 quarters or 2 pennies

   C. 2 pennies, or 1 quarter and 1 penny

   D. 2 quarters, or 1 quarter and 1 penny

Grade 5

Num	Scoring	Standard	Answer
1	B	5-2.1a	4 3 6 1 7 3 0 0
2	C	5-2.1b	0.3
3	D	5-2.1b	Belt, Shirt, Sweater, Watch
4	B	5-2.2a	$16.00
5	C	5-2.2a	62.6 lb
6	C	5-2.2b	$10\frac{5}{12}$ gallons
7	B	5-3.2	acute
8	C	5-4.1a	$125°$
9	D	5-4.1c	Rodolpho
10	C	5-5.2a	$\frac{1}{2}$
11	A	5-5.2b	2 quarters, 2 pennies, or 1 quarter and 1 penny

1. Translate the verbal expression "six more than the difference of a and b" into an algebraic expression.

   A. $6(a - b)$ **B.** $a - b + 6$

   C. $a + b - 6$ **D.** $\dfrac{a}{b} + 6$

2. Which of the following statements are true according to the commutative property of multiplication?

   I. $(3 \times 5) - 2 = (5 \times 3) - 2$

   II. $3 \times 2(5 - 1) = 2 \times 3(5 - 1)$

   III. $3 \times (5 - 1) = 3 \times 5 + 3 \times 1$

   A. I only   **B.** I and II

   C. I and III   **D.** all three

3. You could use the equation $154 - c = 121$ to solve the following problem.

   > Seth has 154 baseball cards. He gave some to his brother and he has 121 left. How many cards did Seth give to his brother?

   What does the "c" in the equation represent?

   A. the number of cards Seth had in the beginning

   B. the number of cards Seth's brother received

   C. the number of cards Seth has now

   D. the number of cards Seth's brother has now

4. Evaluate: $\dfrac{3^2(x - 3)}{6}$ for $x = 7$

   A. 4   **B.** 6   **C.** 18   **D.** 144

5. Bea's Coffee Shop ordered 12 boxes of pastries for the weekend. The boxes ranged in price from $4.85 to $5.10 depending on the kind of pastry. Which is a reasonable estimate for the total cost of the pastries that were ordered for the weekend?

   A. $90   **B.** $60   **C.** $40   **D.** $20

6. After takeoff, an airplane flew at an elevation of 30,000 ft. During the flight, the airplane has risen 10,000 ft, dropped 5,000 ft, and then risen 8,000 ft. The plane has now dropped 32,000 ft as it approaches its final destination. What is the airplane's current elevation?

   A. 8,000 ft   **B.** 11,000 ft

   C. 15,000 ft   **D.** 20,000 ft

7. Which best represents a pair of similar figures?

   A.

   B.

   C.

   D.
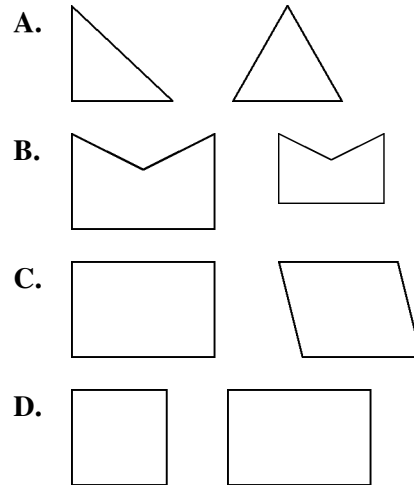
8. What are the coordinates of point *V*?
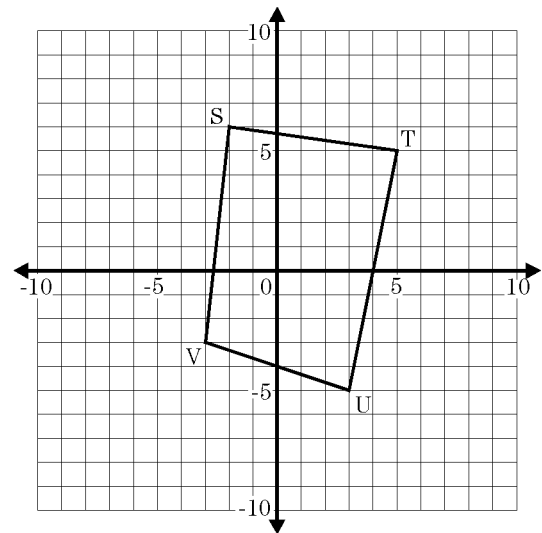
   A. $(3, -5)$ **B.** $(-3, -5)$

   C. $(-3, -3)$ **D.** $(0, -3)$

9. What is the approximate circumference of a circle with diameter 10?

    A. 15.7 **B.** 31.4

    C. 78.5 **D.** 314
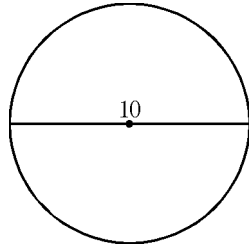
10. Nelson is helping his family move in to its new house. He spent 57 minutes helping unload boxes from the truck, 1 hour and 16 minutes unpacking items from the boxes, and 1 hour and 48 minutes placing these items in different rooms of the house. About how much time in all did Nelson spend on these activities?

    A. 3 hours and 30 minutes

    B. 3 hours and 45 minutes

    C. 4 hours

    D. 4 hours and 15 minutes

11. The graph shows the number of automobiles produced by 6 manufacturing plants. Plant numbers 1, 3, and 5 are located in the same state.

    AUTOMOBILE PRODUCTION
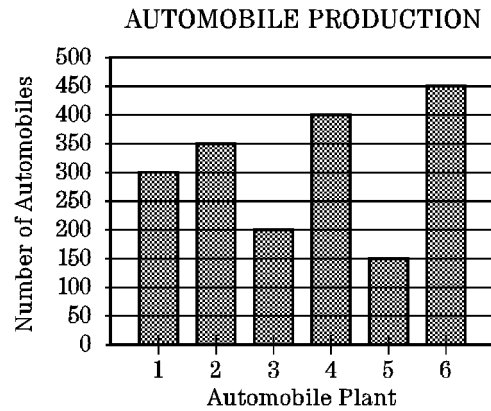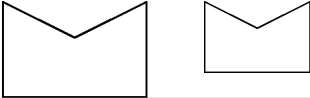
    How many automobiles are produced in the top three plants?

    A. 1200   **B.** 1050

    C. 640   **D.** none of these

12. The scores in a golf tournament on an 18-hole course were: 95, 88, 101, 109, 125, and 130. What was the average score of this group of players?

    A. 106 **B.** 107 **C.** 108 **D.** 109

Grade 6

Num	Scoring	Standard	Answer
1	B	6-1.2	$a - b + 6$
2	B	6-1.2	I and II
3	B	6-1.2	the number of cards Seth's brother received
4	B	6-1.3	6
5	B	6-2.2c	$60
6	B	6-2.2d	11,000 ft
7	B	6-3.2	
8	C	6-3.3	$(-3, -3)$
9	B	6-4.1	31.4
10	C	6-4.2	4 hours
11	A	6-5.1	1200
12	C	6-5.3	108

1. Solve: $16 = 5 - \frac{1}{8}x$

   A. -88 **B.** 168 **C.** $11\frac{1}{8}$ **D.** 88

2. Write an equation that could be used to solve the following problem.

   > A total of 198 plates were served today at the local soup kitchen. If this was an unusually large crowd, how many people (p) normally eat at the soup kitchen given that 2 more than 4 times as many plates as normal were served today?

   A. $6p = 198$ **B.** $4p + 2 = 198$

   C. $4(p + 2) = 198$ **D.** $2(p + 4) = 198$

3. Which of the following makes a true statement?

   A. $3.4 < 2.3$ **B.** $\dfrac{3}{4} < \dfrac{2}{3}$

   C. $3.2 < 2.3$ **D.** $-2.3 < -3.2$

4. The number $\sqrt{55}$ is located between which of the letters on the number line?

A	B	C	D	E	F	G	H	I	J	K
0	1	2	3	4	5	6	7	8	9	10
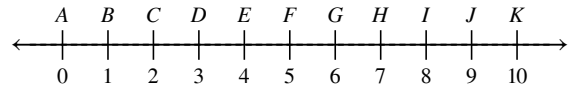
   A. C and D **B.** E and F

   C. G and H **D.** H and I

5. It costs $1250 to move 52 tons of steel across the country by rail. At the same rate, what would it cost to move $6\frac{1}{2}$ tons of steel?

   A. $156.25 **B.** $178.75

   C. $225.00 **D.** $332.50

6. On a map, the scale is 1 inch to 400 miles. If the trip from Corpus Christi to El Paso is 600 miles, how far apart will those cities appear on the map (in inches)?

   A. 0.67 in **B.** 1.5 in

   C. 10 in **D.** 24 in
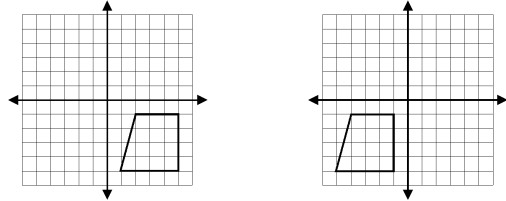
7. Marla bought a new coat for $198. The sales tax was 7.5%. What is the best estimate for the amount of sales tax?
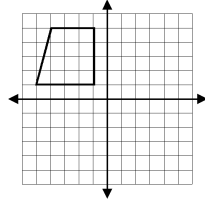
    A. $8   **B.** $10   **C.** $12   **D.** $15
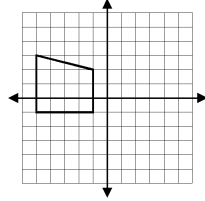
8. Which shape could contain exactly two obtuse angles?
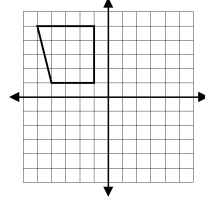
    A. trapezoid   **B.** rectangle

    C. regular hexagon   **D.** square

9. A quadrilateral is graphed. Which figure is a *reflection* of the quadrilateral?

A.

B.

C.

D.

10. What is the area of $\triangle ABC$ if $h = 9$ and $AC = 6$?

    A. 13   **B.** 18

    C. 27   **D.** 34
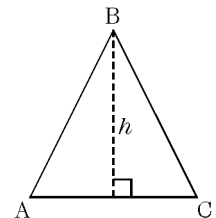
11. What is a reasonable estimate for the area of one of the circles?
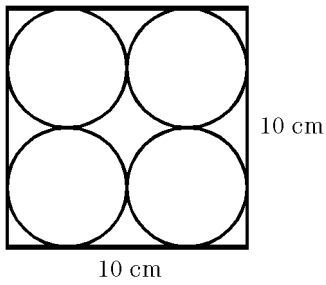
10 cm

10 cm

A. less than $5\,\text{cm}^2$

B. about $10\,\text{cm}^2$

C. about $20\,\text{cm}^2$

D. more than $35\,\text{cm}^2$

12. The chart shows the probability of different outcomes when two coins are tossed.
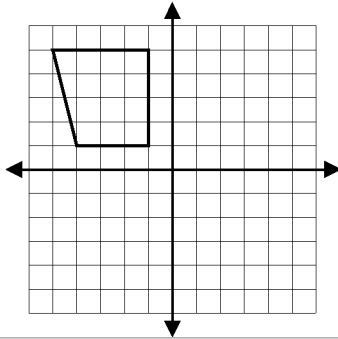
If two coins are tossed 60 times, how many times would they probably both show two heads?

A. 15 times

B. 20 times

C. 30 times

D. 60 times

Outcomes	Probability
2 H	$\frac{1}{4}$
2 T	$\frac{1}{4}$
1 H, 1 T	$\frac{1}{2}$

Grade 7

Num	Scoring	Standard	Answer
1	A	7-1.2	-88
2	B	7-1.2	$4p + 2 = 198$
3	D	7.2.1a	$-2.3 < -3.2$
4	D	7-2.1b	H and I
5	A	7-2.2a	$156.25
6	B	7-2.2a	1.5 in
7	D	7-2.2b	$15
8	A	7-3.1	trapezoid
9	D	7-3.3	
10	C	7-4.1	27
11	C	7-4.2	about $20\,\mathrm{cm}^2$
12	A	7-5.2	15 times

1. Solve: $\dfrac{2}{3}k - 42 = -22$

    A. $\frac{10}{3}$ **B.** 10   **C.** 15   **D.** 30
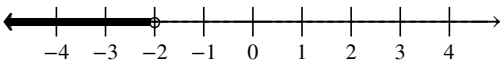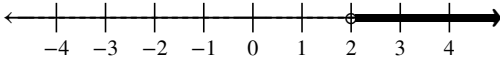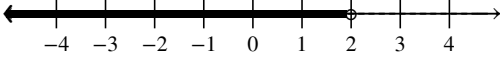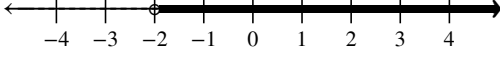
2. Which graph represents $-2x + y + 3 = 0$?

    A.

    B.

    C.

    D.
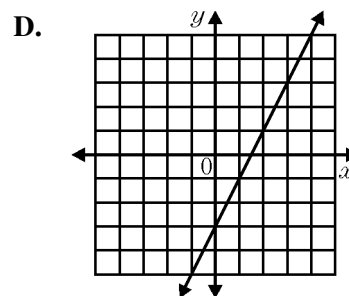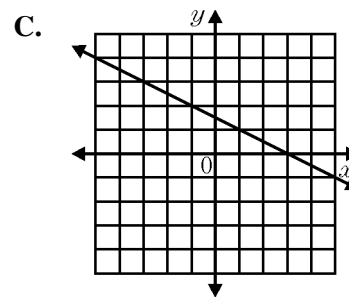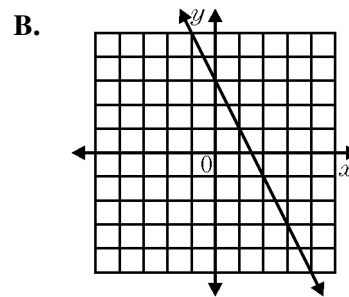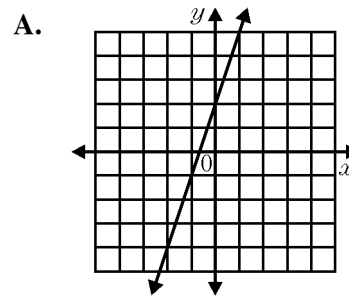
3. The gate receipts at a football game may be calculated by the formula $G = \$2.50s + \$4.00a$, where s is the number of student tickets and a is the number of adult tickets. What were the gate receipts if there were 300 student tickets and 150 adult tickets sold?

   A. $1275.00   **B.** $1350.00

   C. $1425.00   **D.** $1550.00

4. What is the solution to the inequality $3x + 4 > -2$?

   A.

   B.

   C.

   D.

5. Stephan saved $500 to modify his house to minimize damage from hurricanes. The contractor will charge Stephan $135 for showing him how to reinforce his windows, and then $2.50 per rafter end to secure the roof to the walls. Which equation can Stephan use to determine if he has enough money to have all of the rafter ends secured (r is the number of rafter ends)?

   A. $135(2.50) + r \leq 500$

   B. $135 + 2.50r \leq 500$

   C. $135(2.50) + r \geq 500$

   D. $r(1.35) + 250 \geq 500$

6. The earth is about 24,900 miles around at the equator. Express that number in scientific notation.

   A. 2.49×10^5 miles   **B.** 2.49×10^4 miles

   C. 24.9×10^3 miles   **D.** 249×10^2 miles

7. Rewrite 4^{-3} using a positive exponent and evaluate the result.

   A. $\dfrac{1}{4^3} = \dfrac{1}{64}$ **B.** $-4^3 = -64$

   C. $4^3 = 64$ **D.** $\sqrt[3]{4} = 1.5874$

8. Examine the drawing of the 3-dimensional figure. Which of the following is *not* a top, front, or side view of this figure?

A.

B.

C.

D.
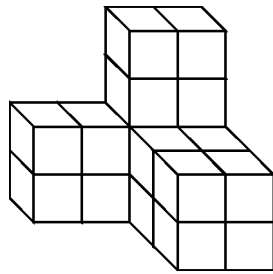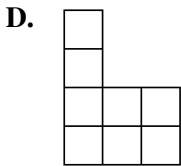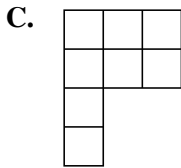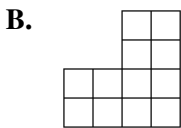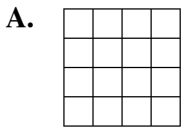
9. A 25-foot ladder is leaning against the side of a building. The ladder is 7 feet from the building. How far from the ground is the point at which the ladder touches the building?

A. 25 ft

B. 24 ft

C. 13 ft

D. 5 ft
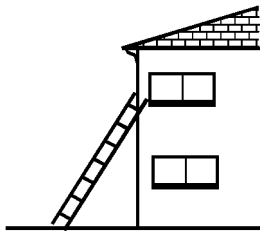
10. Which best describes the relationship between the volume of Box 2 and the volume of Box 1?

Box 1   Box 2
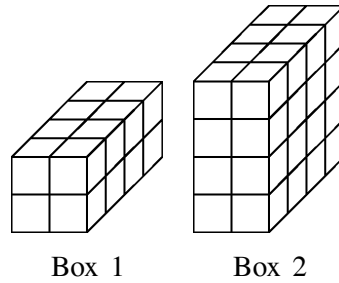
A. The volume of Box 1 is twice the volume of Box 2.

B. The volume of Box 2 is 4 times the volume of Box 1.

C. The volume of Box 1 is half the volume of Box 2.

D. The volume of Box 2 is three times the volume of Box 1.

11. *ABCDE* is similar to *VWXYZ*.

What is the length of segment *VW* ?

A. 5

B. 10

C. 25

D. 42
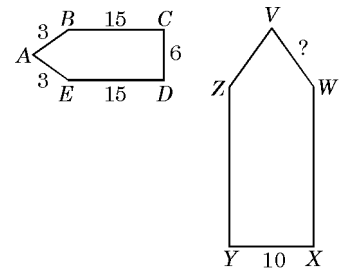
12. Francisco is trying to determine the size of his lawn so that he knows how much fertilizer to apply. His lawn is a large rectangle, but it has a rectangular section missing. (It is fenced off to protect a large utility pole.) Based on the dimensions shown, what is the size of Francisco's lawn in square meters?

15 m

3 m

20 m   4 m
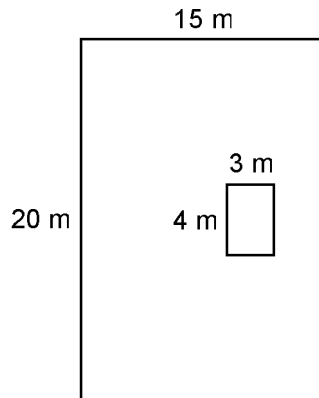
A. 288 m^2

B. 312 m^2

C. 322 m^2

D. none of these

13. Johnny's family drove to his grandparent's house for the holidays. The trip took 10 hours. They left at 7:00 am and arrived at 5:00 pm. They stopped for lunch and then later for gas and snacks. The graph shows the progress of their trip over the 10-hour period.

JOHNNY'S TRIP

Miles Traveled
500
450
400
350
300
250
200
150
100
50

0 1 2 3 4 5 6 7 8 9 10 11
Hours Traveled
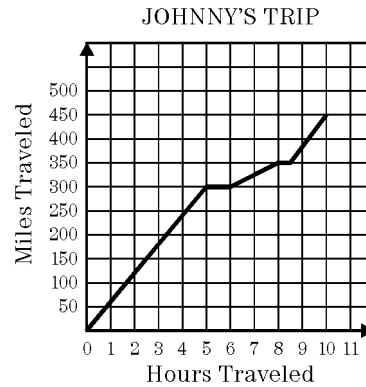
What was their average rate of speed during the first 5 hours of the trip?

A. 50 mph

B. 60 mph

C. 65 mph

D. 70 mph

14. Spinning a spinner that's divided into 4 unequal parts colored blue, red, yellow, or green 10 times resulted in the chart shown. What part of the spinner would you expect to be blue?

Color	Number of Spins
Blue	4
Red	2
Yellow	2
Green	2
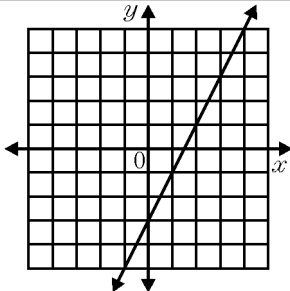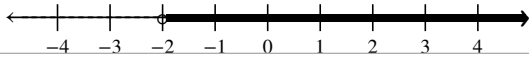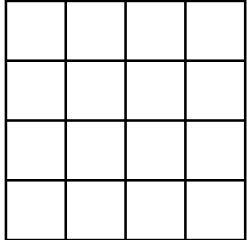
A. $\frac{1}{10}$ **B.** $\frac{2}{5}$ **C.** $\frac{4}{6}$ **D.** $\frac{2}{3}$

15. Traffic engineers took a survey of the number of cars that ran a stop sign at a dangerous intersection. They found that 18 cars out of 200 ran the stop sign during one four-hour period. Based on this, what would be the probability that a car would run the stop sign?

A. 9%   **B.** 18%   **C.** 27%   **D.** 36%

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Grade 8

Num	Scoring	Standard	Answer
1	D	8-1.1a	30
2	D	8-1.1b	
3	B	8-1.1d	$1350.00
4	D	8.1.2	
5	B	8-1.2	$135 + 2.50r \leq 500$
6	B	8-2.1	2.49×10^4 miles
7	A	8-2.2a	$\dfrac{1}{4^3} = \dfrac{1}{64}$
8	A	8-3.1	
9	B	8.3.2	24 ft
10	C	8-4.1	The volume of Box 1 is half the volume of Box 2.
11	A	8-4.2	5
12	A	8-4.3	288 m^2
13	B	8-5.1	60 mph
14	B	8-5.2	$\frac{2}{5}$
15	A	8-5.2	9%

1. The interior angle (I) of a regular polygon is related to the number of sides (n) the polygon has in the following way:

    $$I = \frac{180(n - 2)}{n}$$

    Solve this formula for n.

    A. $n = \dfrac{360}{180 + I}$ **B.** $n = \dfrac{180 + I}{360}$

    C. $n = \dfrac{180}{180 - I}$ **D.** $n = \dfrac{360}{180 - I}$

2. A 31 cm core sample from a large tree is to be divided into five pieces. Two of the pieces will be one length, and the other three will be 2 cm longer. What is the length of the large pieces?

    A. 5 cm   **B.** 5.5 cm

    C. 6.5 cm   **D.** 7 cm

3. Carolyn buys flour for 16 cents per ounce and sugar for 24 cents per ounce. How many ounces of flour are in a mixture of flour and sugar that costs 22 cents per ounce and weighs 20 ounces?

    A. 4 ounces   **B.** 5 ounces

    C. 6 ounces   **D.** 7 ounces

4. Simplify: $(6x^3 + x^2 + 3x - 2) - (x^2 + 2x - 5)$

    A. $6x^3 + x + 3$

    B. $6x^3 + 2x^2 + 5x - 7$

    C. $6x^3 - 2x^2 + x - 7$

    D. $6x^3 + 5x + 3$

5. Write a rule to describe the function shown.

    A. $2x + 3y = -4$

    B. $3x - 2y = -8$

    C. $2x - 3y = -4$

    D. $-3x + 2y = -8$

x	y
-4	-2
-2	1
0	4
2	7

6. What is the solution of the following equation?

$$2(7x - 5) - 6x + 2 = 0$$

A. $x = -3$ **B.** $x = -2$

C. $x = 1$ **D.** $x = 2$

7. Which of these problem situations can be described by a linear function?

A. The distance an object falls is proportional to the square of the length of time that it has been falling.

B. The cost of tree removal is proportional to the size of the tree.

C. The relationship between the volume of a cylinder and its radius, as long as the height of the cylinder remains constant.

D. The area of an equilateral triangle in relation to the length of the side(s) of the triangle.

8. Find the equation of the line perpendicular to the line passing through the coordinates $(-1, 1)$ and $(1, 3)$ with the same x-intercept.

A. $y = -x - 2$ **B.** $y = x - 2$

C. $y = -x + 2$ **D.** $y = x - 2$

9. Consider the graph of $3x + 2y = 5$. Where does the line intersect the x- and y-axis?

A. x-axis: $\frac{5}{2}$ y-axis: $\frac{5}{3}$

B. x-axis: $\frac{5}{2}$ y-axis: $-\frac{5}{3}$

C. x-axis: $\frac{5}{3}$ y-axis: $-\frac{5}{2}$

D. x-axis: $\frac{5}{3}$ y-axis: $\frac{5}{2}$

10. Penelope wishes to save at least $1300 in 8 months. If she saves $400 during the first 3 months, what is the least possible average amount that she must save in each of the remaining 5 months?

11. Logan ate in the cafeteria twice last week. On Monday he had 2 hot dogs and a carton of milk totaling $2.85. On Wednesday he had 3 hot dogs and 2 cartons of milk totaling $4.45. Which system of equations best represents the situation if H represents the cost for each hot dog and M represents the cost for each carton of milk?

A. $2H + M = 4.45$
$3H + 2M = 2.85$

B. $2H + M = 2.85$
$3H + 2M = 4.45$

C. $H + M = 2.85$
$4.45 - M = H$

D. $2H + 2M = 285$
$3H + M = 4.45$

12. Solve: $3x^2 - 6x + 2 = 0$

A. $\left\{-1 + 2\sqrt{3}, -1 - 2\sqrt{3}\right\}$

B. $\left\{1 + 3\sqrt{3}, 1 - 3\sqrt{3}\right\}$

C. $\left\{1 + \dfrac{\sqrt{3}}{3}, 1 - \dfrac{\sqrt{3}}{3}\right\}$

D. no real solutions

13. The table compares the Fahrenheit temperature set on the thermostat to the cost of electricity to cool a large building. Using this data, determine the cost if the thermostat is set to $62°F$?

A. $17410

B. $15830

C. $14250

D. $13460

Temp (°F)	Cost ($)
65	14,250
68	12,670
71	11,090
74	9,510

14. A test for a certain disease is found to be 95% accurate when testing people who have the disease. However, the same test gives a false-positive result for 3% of the healthy patients tested. For a certain segment of the population the incidence of the disease is 8%. If a person tests positive for the disease, find the probability that the person actually has the disease.

A. 0.004   B. 0.266

C. 0.734   D. 0.996

15. You invent a game where a single die is rolled. If a 3 comes up you pay out $9, if an even number comes up you pay out $10, and you pay nothing for anything else. If this is to be a fair game, then how much should you charge a player to play?

    A. $6.50   **B.** $19.00

    C. $19.50   **D.** $4.50

Algebra

Num	Scoring	Standard	Answer
1	D	A-1.1b	$n = \dfrac{360}{180 - I}$
2	D	A-1.1c	7 cm
3	B	A-1.1d	5 ounces
4	A	A-1.2b	$6x^3 + x + 3$
5	B	A-2.1b	$3x - 2y = -8$
6	C	A-2.2a	$x = 1$
7	B	A-2.2b	The cost of tree removal is proportional to the size of the tree.
8	A	A-2.2c.ii	$y = -x - 2$
9	D	A-2.2d	x-axis: $\frac{5}{3}$ y-axis: $\frac{5}{2}$
10		A-2.3a	$180
11	B	A-2.4	$2H + M = 2.85$ $3H + 2M = 4.45$
12	C	A-2.5b	$\left\{ 1 + \dfrac{\sqrt{3}}{3},\, 1 - \dfrac{\sqrt{3}}{3} \right\}$
13	B	A-3.1b	$15830
14	C	A-3.1c	0.734
15	A	A-3.1c	$6.50

1. Which of the parallelograms is a counterexample for the conjecture: Parallelograms have equal diagonals?

| I | II | III |
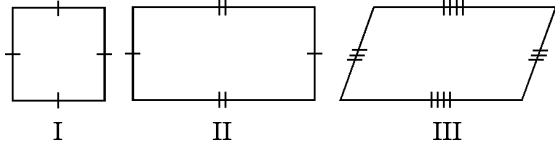
A. I only **B.** III only

C. I and II **D.** II and III

2. Match each statement in section 1 with a statement in section 2 which has the same meaning.

Section 1

A) Skiers have strong legs.

B) If you are a skier, you have weak legs.

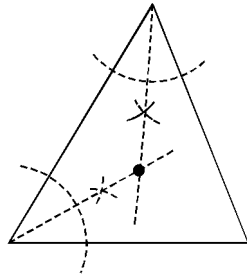C) If you are a non-skier, you have weak legs.

Section 2

1) If you have strong legs, you are a non-skier.

2) If you are a non-skier, you have weak legs.

3) If you have weak legs, you are a non-skier.

A. A and 1 **B.** A and 1
  B and 3   B and 2
  C and 2   C and 3

C. A and 3 **D.** A and 3
  B and 1   B and 2
  C and 2   C and 1

3. The diagram illustrates a method for construction a(n) _____ .

A. incenter

B. circumcenter

C. orthocenter

D. equilateral triangle

5. In the diagram, $AD = CD = CB$ and $m\angle A = 40°$. How many degrees are in $\angle DCB$?

A. 10   B. 20

C. 35   D. 40

6. In $\triangle ABC$, $m\angle B = m\angle ADE$ and $m\angle AED = 65$. Find $m\angle C$.

A. 135

B. 115

C. 65

D. 25

4. In the diagram, what is the measure of $\angle CAB$?

$$4x - 29 \quad\quad 2x + 25$$

A. 27°   B. 32°   C. 54°   D. 79°
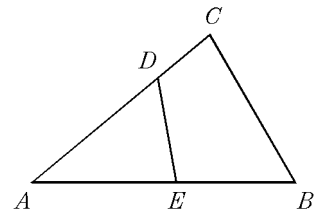
7. Given the circle with center O and with $m\angle ROQ = 150°$, find the measure of minor arc $\overset{\frown}{PR}$.

A. 15°   B. 20°

C. 30°   D. 75°
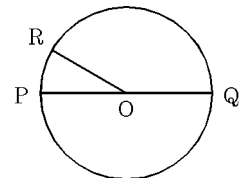
8. Find x.
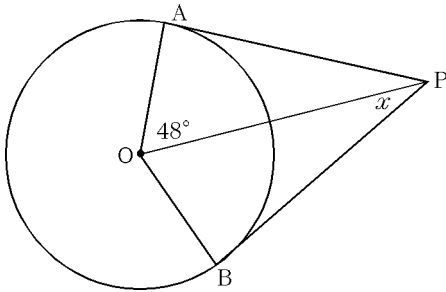
A. $42°$ B. $22°$ C. $48°$ D. $32°$

9. In the given figure, *IJKL* is an isosceles trapezoid with bases $LK = 30$ and $IJ = 20$. If $IL = JK = 13$, then what is the area of the trapezoid?

A. $300\,\text{cm}^2$

B. $355\,\text{cm}^2$

C. $386\,\text{cm}^2$

D. $531\,\text{cm}^2$
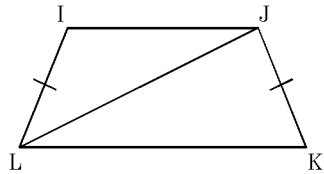
10. A $6\sqrt{2}$ meter long wire is attached to the top of a telephone pole 6 meters tall. What is the exact measure of the angle the wire makes with the ground?

A. $25°$ B. $30°$

C. $45°$ D. $90°$
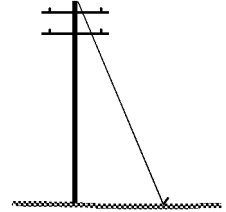
11. What is the area of triangle *ABC* in square centimeters?

A. $5\sqrt{2}$

B. $5\sqrt{3}$

C. 10

D. 5
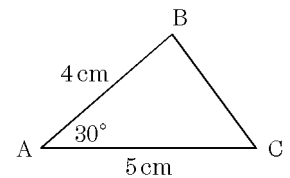
12. Find the volume of the figure. (Assume all angles are right and the measurements are in centimeters.)

   A. 12122 cm

   B. 16559 cm

   C. 23478 cm

   D. 30131 cm
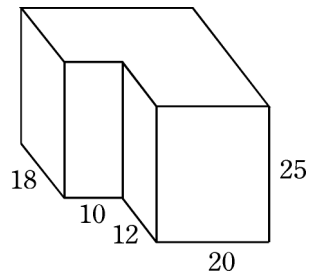
13. Which solid figure would result from folding up the figure shown here?

   A.

   B.

   C.

   D.
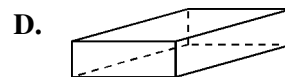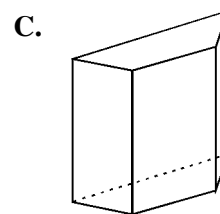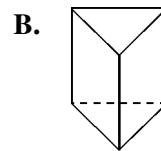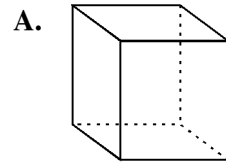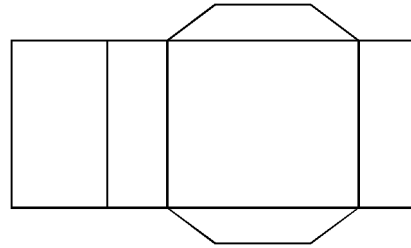
14. When connected in order, which of the following points form a rectangle?

   A. $\{(-2, 0), (0, -2), (2, 4), (4, 2)\}$

   B. $\{(-3, 0), (0, 3), (2, 4), (4, 2)\}$

   C. $\{(-2, 0), (0, -2), (4, 2), (2, 4)\}$

   D. $\{(-3, 0), (0, 3), (0, -4), (4, 0)\}$
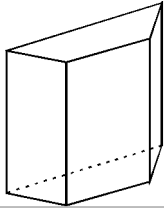
15. $\triangle A'B'C'$ is the image of $\triangle ABC$ after translation of 3 units left and 4 units down. What are the coordinates of each vertex of $\triangle A'B'C'$?
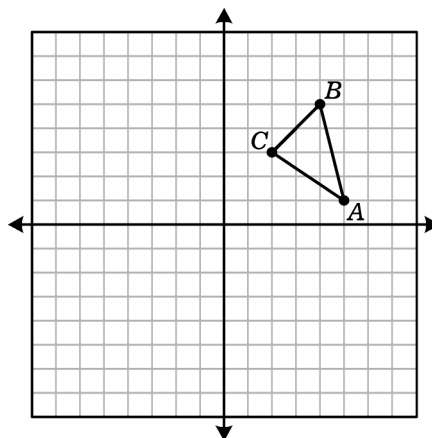
   A. $A'(5, 1)$, $B'(4, 5)$, $C'(2, 3)$

   B. $A'(1, 1)$, $B'(0, 5)$, $C'(-2, 3)$

   C. $A'(5, -2)$, $B'(4, 2)$, $C'(2, 0)$

   D. $A'(2, -3)$, $B'(1, 1)$, $C'(-1, -1)$

Geometry

Num	Scoring	Standard	Answer
1	B	G-1.1	III only
2	C	G-1.2	A and 3 B and 1 C and 2
3	A	G-2.1	incenter
4	D	G-2.2c	$79°$
5	B	G-2.3b	20
6	C	G-2.4b	65
7	C	G-2.6a	$30°$
8	A	G-2.6b	$42°$
9	A	G-3.1	$300 \, \text{cm}^2$
10	C	G-3.2	$45°$
11	D	G-3.4	5
12	D	G-4.1b	30131 cm
13	C	G-4.3	
14	C	G-5.2a	$\{(-2,0),\ (0,-2),\ (4,2),\ (2,4)\}$
15	D	G-5.2b	$A'(2,-3),\ B'(1,1),\ C'(-1,-1)$

1. Which one of the following radicals *cannot* be simplified?

   A. $\sqrt{46}$ B. $\sqrt{72}$

   C. $\sqrt{75}$ D. $\sqrt{104}$

2. Simplify: $(7 - \sqrt{3})^2$

   A. 42   B. 46

   C. $52 - 7\sqrt{3}$ D. $52 - 14\sqrt{3}$

3. Express the product of $3 + 2i$ and $2i$ in the form $a + bi$.

   A. $-4 + 6i$ B. $4 - 6i$

   C. $3 - 4i$ D. $2 + i$

4. How is the graph $y = \frac{1}{3}(x - 2)^2$ related to the graph of $y = x^2$?

   I. horizontal expansion by a factor of 3

   II. vertical expansion by a factor of 3

   III. translation of 2 units left

   IV. translation of 2 units right

   A. I and IV   B. II and III

   C. II and IV   D. none of these

5. Find $g(f(x))$, given $f(x) = 4x - 1$ and $g(x) = \dfrac{2x^2 + 3x}{2x}$.

   A. $\dfrac{8x + 1}{2}$ B. $\dfrac{8x - 1}{2}$

   C. $\dfrac{32x^2 - 4x + 2}{2(4x - 1)}$ D. $\dfrac{x^2 - 2x + 2}{2(4x - 1)}$

6. Which of the following graphs is the inverse of $y = -(x - 2)^2 - 3$?

A.

B.

C.

D.

8. Use Cramer's rule to find the value of z?

$$x + 2y - 5z = -1$$
$$4x - 4y - 5z = 5$$
$$3x + 3y - 5z = -2$$

hint: $\begin{vmatrix} 1 & 2 & -5 \\ 4 & -4 & -5 \\ 3 & 3 & -5 \end{vmatrix} = -75$

A. $-\dfrac{1}{5}$ **B.** 0 **C.** $\dfrac{1}{5}$ **D.** 1

9. What is the discriminant of $7x^2 - 2x - 3 = 0$?

A. -88 **B.** 80

C. 88 **D.** $2\sqrt{22}$
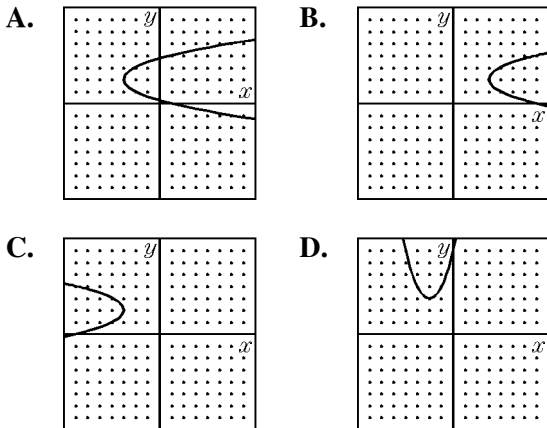
7. Driving to her summer cottage Amy averaged 80 kph. Since the weather was so good she decided to ride her bike back to town and was able to average 20 kph. If the total time for the round trip is 8 hours, then how far is it from the cottage to town?

A. 102 km   **B.** 112 km

C. 120 km   **D.** 128 km

10. Find the rational root of the following equation:

$$x^3 - 3x^2 + 5x - 6 = 0$$

A. -6 **B.** $\frac{1}{2}$ **C.** 2 **D.** 6

11. The average cost of an item is defined as the total cost to produce it divided by the number of units produced. Handy Glove Company pays $680,000 in rent and employee salaries per year. It cost Handy Glove $5.20 in materials to produce a pair of gloves.

What is the average cost per pair of gloves if Handy Glove produces 250,000 pairs?

A. $9.90

B. $7.92

C. $5.20

D. $2.48

12. Twenty five students take a mathematics exam consisting of 40 multiple choice questions. The distribution of scores on the test is as follows.

Raw Score on Test	Number of Students
0–8	1
8–16	4
16–24	8
24–32	9
32–40	3

Find the weighted mean for the data.

A. 22.8 **B.** 23.9 **C.** 19.9 **D.** 20.5

13. The weights of a bags of pretzels are distributed normally with a mean of 385 grams and a variance of 361. What percent of pretzel bags will likely weigh less than 423 grams?

A. 84.13

B. 97.72

C. 17.11

D. 47.72

14. Write the first four terms of the sequence having the formula $t_n = \dfrac{(-2)^n}{8}$. Then tell whether the sequence is *arithmetic*, *geometric*, or *neither*.

A. $-\frac{1}{4}, \frac{1}{2}, -\frac{3}{4}, \frac{4}{3}$; geometric

B. $-\frac{1}{4}, \frac{1}{2}, -1, 2$; arithmetic

C. $-\frac{1}{4}, \frac{1}{2}, -1, 2$; geometric

D. $-\frac{1}{4}, \frac{1}{2}, -\frac{3}{4}, \frac{4}{3}$; neither

15. Find the inverse:

$$\begin{bmatrix} 3 & 3 & 1 \\ 1 & -2 & -1 \\ 2 & 3 & 1 \end{bmatrix}$$

A. $\begin{bmatrix} -1 & 0 & 1 \\ -3 & 1 & 4 \\ 7 & -3 & -9 \end{bmatrix}$
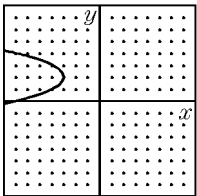
B. $\begin{bmatrix} 1 & 0 & -1 \\ -3 & 1 & 4 \\ 7 & -3 & -9 \end{bmatrix}$

C. $\begin{bmatrix} 1 & 0 & -1 \\ 3 & 1 & 4 \\ 7 & -3 & -9 \end{bmatrix}$

D. $\begin{bmatrix} 1 & 0 & -1 \\ -3 & 1 & -4 \\ -7 & -3 & 9 \end{bmatrix}$

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Algebra 2

Num	Scoring	Standard	Answer
1	A	A2-1.1b	$\sqrt{46}$
2	D	A2-1.1b	$52 - 14\sqrt{3}$
3	A	A2-1.3b	$-4 + 6i$
4	A	A2-2.1a	I and IV
5	A	A2-2.1c	$\dfrac{8x + 1}{2}$
6	C	A2-2.1e	
7	D	A2-2.2a	128 km
8	A	A2-2.2b	$-\dfrac{1}{5}$
9	C	A2-2.3a	88
10	C	A2-2.6a	2
11	B	A2-2.7d	$7.92
12	A	A2-3.2a	22.8
13	B	A2-3.2c	97.72
14	C	A2-3.3	$-\frac{1}{4}, \frac{1}{2}, -1, 2$; geometric
15	B	A2 extra	$\begin{bmatrix} 1 & 0 & -1 \\ -3 & 1 & 4 \\ 7 & -3 & -9 \end{bmatrix}$