NY Regents Algebra II Samples

(1) Which is the fourth term in the expansion of $(\cos x + 3)^5$?

A. $90\cos^2 x$ B. $270\cos^2 x$

C. $90\cos^3 x$ D. $270\cos^3 x$

(2) A school district offers hockey and basketball. The result of a survey of 300 students showed:

120 students play hockey, only
90 students play basketball, only
30 students do not participate in either sport

Of those surveyed, how many students play both hockey and basketball?

(3) Given:

$U = \{1, 2, 3, 4, 5, 6, 7, 8\}$
$B = \{2, 3, 5, 6\}$

Set B is a subset of set U. What is the complement of set B?

A. $\{\}$

B. $\{2, 3, 5, 6\}$

C. $\{1, 4, 7, 8\}$

D. $\{1, 2, 3, 4, 5, 6, 7, 8\}$

(4) If $f(x) = x^2 + 2$, what is the value of $f(3i)$?

A. 11 B. 8 C. -7 D. -4

(5) If a quadratic equation with real coefficients has a discriminant of 3, then the two roots must be

A. real and rational

B. real and irrational

C. imaginary

D. equal

(6) The roots of a quadratic equation are 4 and -5. Which quadratic equation has these roots?

A. $(x-4)(x+5) = 0$ B. $(x+4)(x-5) = 0$

C. $(x-4)(x-5) = 0$ D. $(x+4)(x+5) = 0$

(7) Which transformation does not always produce an image that is congruent to the original figure?

A. translation B. dilation

C. rotation D. reflection

(8) If point P with coordinates (a, b) is reflected in the line $y = x$, what are the coordinates of the image of P ?

(9) What is the image of point $(-1, 3)$ after a reflection in the line $x = 2$?

A. $(5, 3)$ B. $(3, 3)$

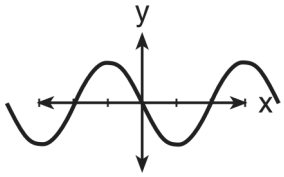
C. $(-1, 1)$ D. $(-1, -3)$

(10) Which is the image of A under the transformation $r_{x\text{-axis}} \circ R_{90^\circ}$?

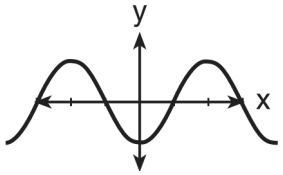
A. A B. ∀ C. ∀ D. ∀

(11) If $f(x) = \cos x$, which graph represents $f(x)$ under the composition $r_{y-axis} \circ r_{x-axis}$?

A.



B.



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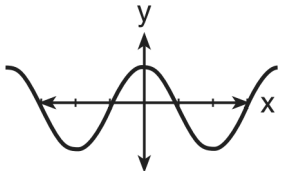
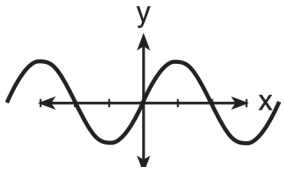


D.

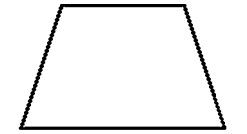


(12) Which letter has horizontal but *not* vertical line symmetry?

A. X B. O C. V D. E

(13) Which geometric figure has one and only one line of symmetry?

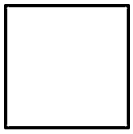
A.


Isosceles trapezoid

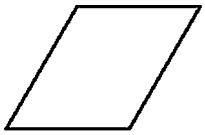
B.


Rectangle

C.


Square

D.


Rhombus

(14) What is the inverse of the statement "If Bob gets hurt, then the team loses the game"?

A. If the team loses the game, then Bob gets hurt.

B. Bob gets hurt if the team loses the game.

C. If the team does not lose the game, then Bob does not get hurt.

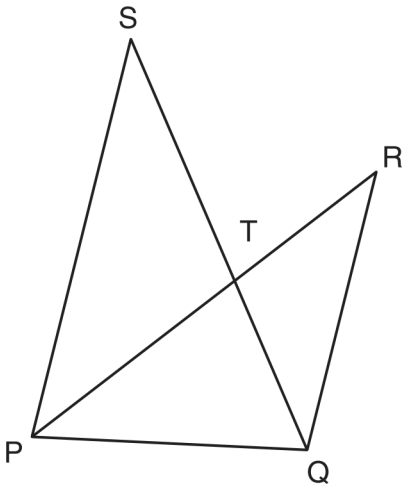
D. If Bob does not get hurt, then the team does not lose the game.

(15) The inverse of a given statement is $\sim s \rightarrow r$. What is the given statement?

A. $r \rightarrow s$ B. $r \rightarrow \sim s$

C. $\sim r \rightarrow s$ D. $s \rightarrow \sim r$

(16) In the diagram below, $\overline{SQ}$ and $\overline{PR}$ intersect at T, $\overline{PQ}$ is drawn, and $\overline{PS} \parallel \overline{QR}$



Which technique can be used to prove $\triangle PST \sim \triangle RQT$?

A. SAS B. SSS C. ASA D. AA

(17) How many different eight-letter permutations can be formed from the letters in the word "PARALLEL"?

A. $\frac{8!}{3!\,2!}$ B. $8!$ C. 360 D. $\frac{8!}{3!}$

(18) Which expression is not equivalent to ${}_7C_2$?

A. ${}_7P_5$ B. 21

C. $\frac{7 \cdot 6 \cdot 5 \cdot 4 \cdot 3}{5 \cdot 4 \cdot 3 \cdot 2 \cdot 1}$ D. ${}_7C_2$

(19) A letter is chosen at random from the word "SPINNER." Find the probability that the letter chosen is an N.

(20) What is the probability that any two sides of a rhombus are congruent?

(21) A single card is drawn from a standard deck of 52 cards. What is the probability the card is a five or a diamond?

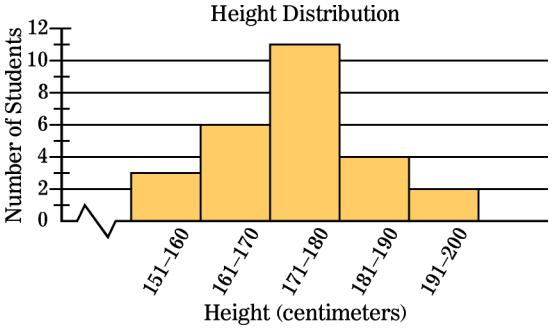
A. $\frac{17}{52}$ B. $\frac{15}{32}$ C. $\frac{16}{52}$ D. $\frac{18}{52}$

(22) When Paula went bowling, she scored 118 and 138 in her first two games. What must she score in a third game to have an average score of 132?

(23) On a standardized examination, Laura received a score of 85, which was exactly 2 standard deviations above the mean. If the standard deviation for the examination is 4, what is the mean for this examination?

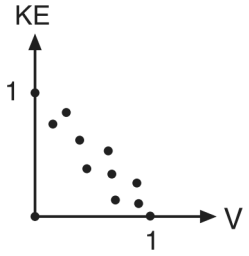
A. 93 B. 87 C. 83 D. 77

(24) The accompanying histogram shows the height distribution for students in a high school mathematics class. What is the total number of students in the class?

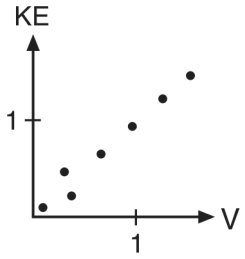


(25) In the physics lab, Thelma determined the kinetic energy, *KE*, of an object at various velocities, *V*, and found the linear correlation coefficient between *KE* and *V* to be +0.8. Which graph shows this relationship?

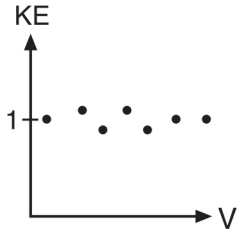
A.



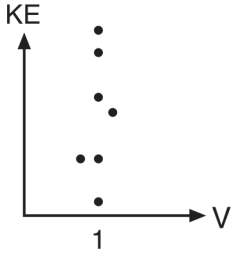
B.



C.



D.



(26) Written in set-builder notation, $S = \{1, 3, 5, 7, 9\}$ is

A. $\{x|1 < x < 9$, where x is a prime number$\}$

B. $\{x|1 \leq x \leq 9$, where x is a prime number$\}$

C. $\{x|1 < x < 9$, where x is an odd integer$\}$

D. $\{x|1 \leq x \leq 9$, where x is an odd integer$\}$

(27) If the operation ◆ is defined as $a \blacklozenge b = 2a - b^2$, evaluate $3 \blacklozenge 2$.

(28) Using the accompanying table solve for y if $a \heartsuit y = c \heartsuit d$.

♥	a	b	c	d
a	b	c	d	a
b	c	d	a	b
c	d	a	b	c
d	a	b	c	d