

Use this space for computations.

4 The math department needs to buy new textbooks and laptops for the computer science classroom. The textbooks cost \$116.00 each, and the laptops cost \$439.00 each. If the math department has \$6500 to spend and purchases 30 textbooks, how many laptops can they buy?

- (1) 6 (3) 11
(2) 7 (4) 12

5 What is the solution to the equation $\frac{3}{5}\left(x + \frac{4}{3}\right) = 1.04$?

- (1) $3.0\bar{6}$ (3) $-0.4\bar{8}$
(2) 0.4 (4) $-0.709\bar{3}$

6 The area of a rectangle is represented by $3x^2 - 10x - 8$. Which expression can also be used to represent the area of the same rectangle?

- (1) $(3x + 2)(x - 4)$ (3) $(3x + 4)(x - 2)$
(2) $(3x + 2)(x + 4)$ (4) $(3x - 4)(x + 2)$

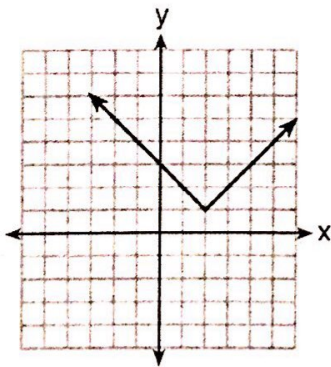
7 Which relation does *not* represent a function?

x	1	2	3	4	5	6
y	3.2	4	5.1	6	7.4	8.8

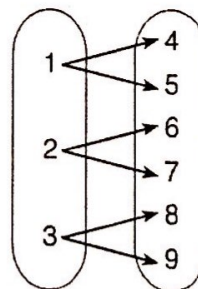
(1)

$$y = 3\sqrt{x+1} - 2$$

(3)



(2)



(4)

8 Britney is solving a quadratic equation. Her first step is shown below.

$$\text{Problem: } 3x^2 - 8 - 10x = 3(2x + 3)$$

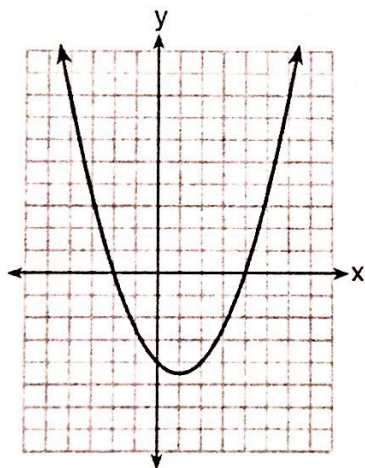
$$\text{Step 1: } 3x^2 - 10x - 8 = 6x + 9$$

Which two properties did Britney use to get to step 1?

- I. addition property of equality
- II. commutative property of addition
- III. multiplication property of equality
- IV. distributive property of multiplication over addition

- (1) I and III
- (2) I and IV
- (3) II and III
- (4) II and IV

9 The graph of $y = \frac{1}{2}x^2 - x - 4$ is shown below. The points $A(-2,0)$, $B(0,-4)$, and $C(4,0)$ lie on this graph.



Which of these points can determine the zeros of the equation $y = \frac{1}{2}x^2 - x - 4$?

- (1) A, only
- (2) B, only
- (3) A and C, only
- (4) A, B, and C

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10 Given the parent function $f(x) = x^3$, the function $g(x) = (x - 1)^3 - 2$ is the result of a shift of $f(x)$

- (1) 1 unit left and 2 units down
- (2) 1 unit left and 2 units up
- (3) 1 unit right and 2 units down
- (4) 1 unit right and 2 units up

11 If $C = 2a^2 - 5$ and $D = 3 - a$, then $C - 2D$ equals

- (1) $2a^2 + a - 8$
- (2) $2a^2 - a - 8$
- (3) $2a^2 + 2a - 11$
- (4) $2a^2 - a - 11$

12 Marc bought a new laptop for \$1250. He kept track of the value of the laptop over the next three years, as shown in the table below.

Years After Purchase	Value in Dollars
1	1000
2	800
3	640

Which function can be used to determine the value of the laptop for x years after the purchase?

- (1) $f(x) = 1000(1.2)^x$
- (2) $f(x) = 1000(0.8)^x$
- (3) $f(x) = 1250(1.2)^x$
- (4) $f(x) = 1250(0.8)^x$

13 The height of a ball Doreen tossed into the air can be modeled by the function $h(x) = -4.9x^2 + 6x + 5$, where x is the time elapsed in seconds, and $h(x)$ is the height in meters. The number 5 in the function represents

- (1) the initial height of the ball
- (2) the time at which the ball reaches the ground
- (3) the time at which the ball was at its highest point
- (4) the maximum height the ball attained when thrown in the air

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14 The function $f(x) = 2x^2 + 6x - 12$ has a domain consisting of the integers from -2 to 1 , inclusive. Which set represents the corresponding range values for $f(x)$?

- (1) $\{-32, -20, -12, -4\}$ (3) $\{-32, -4\}$
(2) $\{-16, -12, -4\}$ (4) $\{-16, -4\}$

15 Which equation has the same solution as $x^2 + 8x - 33 = 0$?

- (1) $(x + 4)^2 = 49$ (3) $(x + 4)^2 = 17$
(2) $(x - 4)^2 = 49$ (4) $(x - 4)^2 = 17$

16 The table below shows the weights of Liam's pumpkin, $l(w)$, and Patricia's pumpkin, $p(w)$, over a four-week period where w represents the number of weeks. Liam's pumpkin grows at a constant rate. Patricia's pumpkin grows at a weekly rate of approximately 52%.

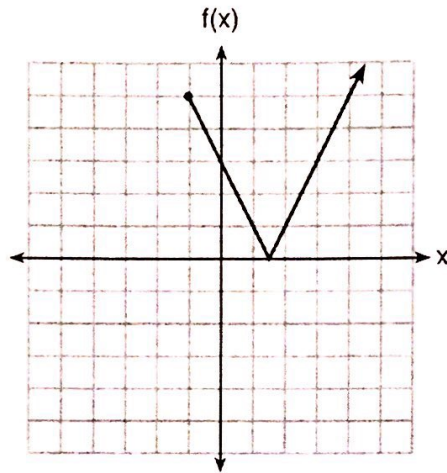
Weeks w	Weight in Pounds $l(w)$	Weight in Pounds $p(w)$
6	2.4	2.5
7	5.5	3.8
8	8.6	5.8
9	11.7	8.8

Assume the pumpkins continue to grow at these rates through week 13. When comparing the weights of both Liam's and Patricia's pumpkins in week 10 and week 13, which statement is true?

- (1) Liam's pumpkin will weigh more in week 10 and week 13.
(2) Patricia's pumpkin will weigh more in week 10 and week 13.
(3) Liam's pumpkin will weigh more in week 10, and Patricia's pumpkin will weigh more in week 13.
(4) Patricia's pumpkin will weigh more in week 10, and Liam's pumpkin will weigh more in week 13.

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17 The function $f(x)$ is graphed below.



The domain of this function is

- (1) all positive real numbers (3) $x \geq 0$
(2) all positive integers (4) $x \geq -1$

18 Which pair of equations would have $(-1, 2)$ as a solution?

- (1) $y = x + 3$ and $y = 2^x$
(2) $y = x - 1$ and $y = 2x$
(3) $y = x^2 - 3x - 2$ and $y = 4x + 6$
(4) $2x + 3y = -4$ and $y = -\frac{1}{2}x - \frac{3}{2}$

19 Which function could be used to represent the sequence 8, 20, 50, 125, 312.5, ..., given that $a_1 = 8$?

- (1) $a_n = a_{n-1} + a_1$ (3) $a_n = a_1 + 1.5(a_{n-1})$
(2) $a_n = 2.5(a_{n-1})$ (4) $a_n = (a_1)(a_{n-1})$

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20 The formula for electrical power, P , is $P = I^2R$, where I is current and R is resistance. The formula for I in terms of P and R is

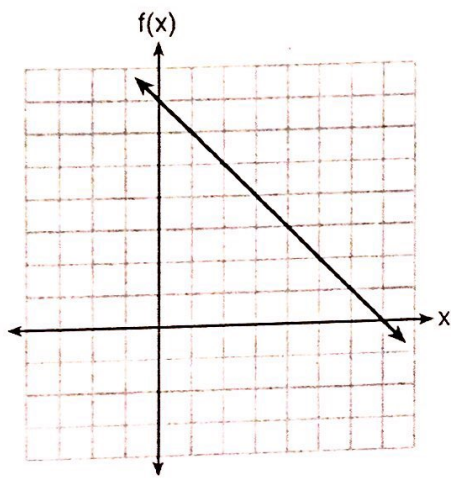
(1) $I = \left(\frac{P}{R}\right)^2$

(3) $I = (P - R)^2$

(2) $I = \sqrt{\frac{P}{R}}$

(4) $I = \sqrt{P - R}$

21 The functions $f(x)$, $q(x)$, and $p(x)$ are shown below.



$q(x) = (x - 1)^2 - 6$

x	p(x)
2	5
3	4
4	3
5	4
6	5

When the input is 4, which functions have the same output value?

- (1) $f(x)$ and $q(x)$, only (3) $q(x)$ and $p(x)$, only
 (2) $f(x)$ and $p(x)$, only (4) $f(x)$, $q(x)$, and $p(x)$

22 Using the substitution method, Vito is solving the following system of equations algebraically:

$$\begin{aligned} y + 3x &= -4 \\ 2x - 3y &= -21 \end{aligned}$$

Which equivalent equation could Vito use?

- (1) $2(-3x - 4) + 3x = -21$ (3) $2x - 3(-3x - 4) = -21$
 (2) $2(3x - 4) + 3x = -21$ (4) $2x - 3(3x - 4) = -21$

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23 Materials A and B decay over time. The function for the amount of material A is $A(t) = 1000(0.5)^{2t}$ and for the amount of material B is $B(t) = 1000(0.25)^t$, where t represents time in days. On which day will the amounts of material be equal?

- (1) initial day, only (3) day 5, only
(2) day 2, only (4) every day

24 The following conversion was done correctly:

$$\frac{3 \text{ miles}}{1 \text{ hour}} \cdot \frac{1 \text{ hour}}{60 \text{ minutes}} \cdot \frac{5280 \text{ feet}}{1 \text{ mile}} \cdot \frac{12 \text{ inches}}{1 \text{ foot}}$$

What were the final units for this conversion?

- (1) minutes per foot
(2) minutes per inch
(3) feet per minute
(4) inches per minute
-