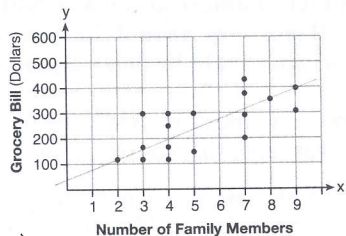


ALGEBRA 1
January 2019
Part I

Answer all 24 questions in this part. Each correct answer will receive 2 credits. No partial credit will be allowed. For each statement or question, choose the word or expression that, of those given, best completes the statement or answers the question. Record your answers in the space provided. [48]

1. The scatter plot shows the relationship between the number of members in a family and the amount of the family's weekly grocery bill.



The most appropriate prediction of the grocery bill for a family that consists of six members is

- (1) \$100 (2) \$300 (3) \$400 (4) \$500 1 2

2. The function $g(x)$ is defined as $g(x) = -2x^2 + 3x$. The value of $g(-3)$ is
(1) -27 (2) -9 (3) 27 (4) 45 2 1

3. Which expression results in a rational number?
(1) $\sqrt{121} - \sqrt{21}$ (2) $\sqrt{25} \cdot \sqrt{50}$ (3) $\sqrt{36} \div \sqrt{225}$ (4) $3\sqrt{5} + 2\sqrt{5} = 5\sqrt{5}$
5√50 = irrational 3 3

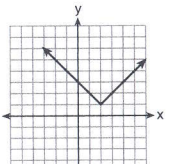
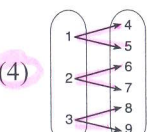
4. The math department needs to buy new textbooks and laptops for the computer science classroom. The textbooks cost \$116.00 each, and the laptops cost \$439.00 each. If the math department has \$6500 to spend and purchases 30 textbooks, how many laptops can they buy?
(1) 6 (2) 7 (3) 11 (4) 12 4 1

5. What is the solution to the equation $\frac{3}{5}(x + \frac{4}{3}) = 1.04$?
(1) $3.0\bar{6}$ (2) 0.4 (3) $-0.4\bar{8}$ (4) $-0.709\bar{3}$ 5 2

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) $(3x+2)(x-4)$ (2) $(3x+2)(x+4)$ (3) $(3x+4)(x-2)$ (4) $(3x-4)(x+2)$ 6 1

7. Which relation does not represent a function?
(1)

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

 (2)  (3) $y = 3\sqrt{x+1} - 2$ (4)  7 4

ALGEBRA 1
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8. Britney is solving a quadratic equation. Her first step is shown below.

Problem: $3x^2 - 8 - 10x = 3(2x + 3)$

Step 1: $3x^2 - 10x - 8 = 6x + 9$

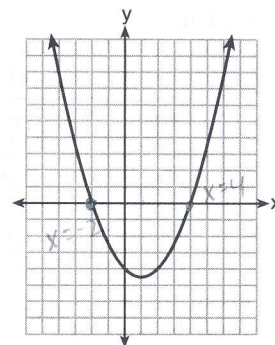
Which two properties did Britney use to get to step 1?

- 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 8 4

9. The graph of $y = \frac{1}{2}x^2 - x - 4$ is shown.

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 9 3

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 10 3

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) $2a^2 - a - 11$ 11 3

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.

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) $f(x) = 1250(0.8)^x$ 12 4

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 13 1

2.) $g(x) = -2(-3)^2 + 3(-3)$ 13.) $h(x) = -4.9x^2 + 16x + 5$
 $g(-3) = -27$ $c = y$ -intercept
 initial height

4.) $116(30) + 439x \leq 6500$

$3480 + 439x \leq 6500$

$\frac{-3480}{-3480} \quad \frac{-3480}{-3480}$

$439x \leq 3020$

$\frac{439x}{439} \leq \frac{3020}{439}$

$x \leq 6.87$

5.) $\left[\frac{3}{5} \left(x + \frac{4}{3} \right) = 1.04 \right]$

$3 \left(x + \frac{4}{3} \right) = 5.2$

$3x + 4 = 5.2$

$\frac{-4 \quad -4}{-4 \quad -4}$

$3x = 1.2$

$\frac{3x}{3} = \frac{1.2}{3}$

$x = 0.4$

6.) $(3x^2 - 10x - 8)$

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

$\frac{-24}{-12} \quad \frac{2}{-10}$

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

11.) $C = 2D$

$(2a^2 - 5) - 2(3 - a)$

$(2a^2 - 5) - 6 + 2a$

$2a^2 + 2a - 11$