

DO NOW

Let f be a function such that $f(x) = 2x - 4$ is defined on the domain $2 \leq x \leq 6$. The range of this function is

(1) $0 \leq y \leq 8$

(3) $2 \leq y \leq 6$

(2) $0 \leq y < \infty$

(4) $-\infty < y < \infty$

→ Restricted
Domain

$$f(2) = 2(2) - 4 = 0 \quad f(6) = 2(6) - 4 = 8$$

$$[0, 8]$$

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Homework Answers

1) 3 7) 2 13) 3

2) 4 8) 1 14) 3

3) 1 9) 4 15) 4

4) 2 10) 2 16) 3

5) 1 11) 2 17) 2

6) 1 12) 1 18) 4

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1 The expression $\sqrt{x^4 - 16}$ is equivalent to

- (1) $(x^2 + 8)(x^2 - 8)$ (3) $(x^2 + 4)(x^2 - 4)$
(2) $(x^2 - 8)(x^2 - 8)$ (4) $(x^2 - 4)(x^2 - 4)$

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

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2 An expression of the fifth degree is written with a leading coefficient of seven and a constant of six. Which expression is correctly written for these conditions?

- (1) $6x^5 + x^4 + 7$ (3) ~~$6x^5 - x^5 + 5$~~
(2) ~~$7x^6 - 6x^4 + 5$~~ (4) $7x^5 + 2x^2 + 6$

Exponent of 5

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3 The table below shows the year and the number of households in a building that had high-speed broadband internet access.

y	Number of Households	11	16	23	33	42	47
X	Year	2002	2003	2004	2005	2006	2007

For which interval of time was the average rate of change the *smallest*?

- (1) 2002 – 2004
- (2) 2003 – 2005
- (3) 2004 – 2006
- (4) 2005 – 2007

$$(1) \frac{23-11}{2004-2002} = 6$$

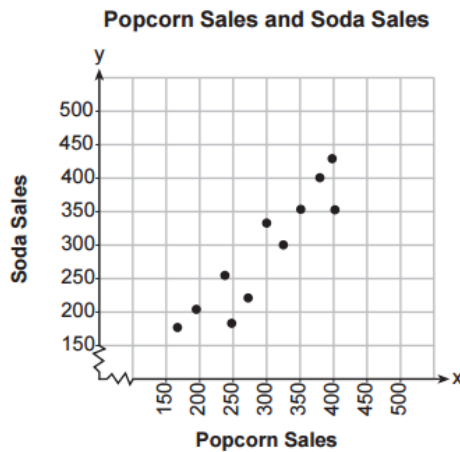
$$(3) \frac{42-23}{2006-2004}$$

$$(2) \frac{33-16}{2005-2003}$$

$$(4) \frac{47-33}{2007-2005}$$

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4 The scatterplot below compares the number of bags of popcorn and the number of sodas sold at each performance of the circus over one week.



Which conclusion can be drawn from the scatterplot?

- (1) There is a ~~negative correlation~~ between popcorn sales and soda sales.
- (2) There is a positive correlation between popcorn sales and soda sales.
- (3) There is ~~no correlation~~ between popcorn sales and soda sales.
- (4) ~~Buying popcorn causes people to buy soda.~~

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5 The Celluloid Cinema sold 150 tickets to a movie. Some of these were child tickets and the rest were adult tickets. A child ticket cost \$7.75 and an adult ticket cost \$10.25. If the cinema sold \$1470 worth of tickets, which system of equations could be used to determine how many adult tickets, a , and how many child tickets, c , were sold?

- (1) $a + c = 150$
 $10.25a + 7.75c = 1470$
- (2) $a + c = 1470$
 $10.25a + 7.75c = 150$
- (3) $a + c = 150$
 $7.75a + 10.25c = 1470$
- (4) $a + c = 1470$
 $7.75a + 10.25c = 150$

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6 The tables below show the values of four different functions for given values of x .

x	$f(x)$
1	12
2	19
3	26
4	33

x	$g(x)$
1	-1
2	1
3	5
4	13

x	$h(x)$
1	9
2	12
3	17
4	24

x	$k(x)$
1	-2
2	4
3	14
4	28

Which table represents a linear function?

- (1) $f(x)$
- (2) $g(x)$
- (3) $h(x)$
- (4) $k(x)$

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7 The acidity in a swimming pool is considered normal if the average of three pH readings, p , is defined such that $7.0 < p < 7.8$. If the first two readings are 7.2 and 7.6, which value for the third reading will result in an overall rating of normal?

- (1) 6.2
- (2) 7.3
- (3) 8.6
- (4) 8.8

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8 Dan took 12.5 seconds to run the 100-meter dash. He calculated the time to be approximately

- (1) 0.2083 minute
 - (2) 750 minutes
 - (3) 0.2083 hour
 - (4) 0.52083 hour
- 12 min*
- 30 min*

$$\frac{12.5}{60}$$

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9 When $3x + 2 \leq 5(x - 4)$ is solved for x , the solution is

- (1) $x \leq 3$
- (2) $x \geq 3$
- (3) $x \leq -11$
- (4) $x \geq 11$

$$\cancel{3x} + 2 \leq 5x - 20$$

$$\begin{array}{r} -3x \quad -3x \\ \hline 2 \leq 2x - 20 \\ +20 \quad +20 \end{array}$$

$$\begin{array}{r} 22 \leq \cancel{2x} \\ \hline 11 \leq x \end{array}$$

$$x \geq 11$$

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10 The expression $3(x^2 - 1) - (x^2 - 7x + 10)$ is equivalent to

- (1) $2x^2 - 7x + 7$
- (2) $2x^2 + 7x - 13$
- (3) $2x^2 - 7x + 9$
- (4) $2x^2 + 7x - 11$

$$3x^2 - 3 - x^2 + 7x - 10$$

$$2x^2 + 7x - 13$$

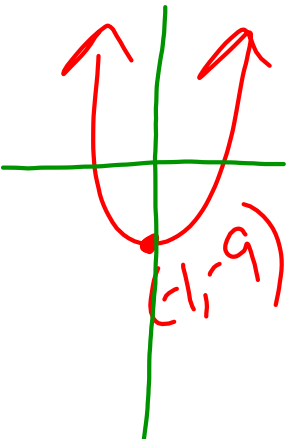
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11 The range of the function $f(x) = x^2 + 2x - 8$ is all real numbers

- (1) less than or equal to -9
- (2) greater than or equal to -9
- (3) less than or equal to -1
- (4) greater than or equal to -1

Range
y-value Vertex $(-1, -9)$

$a = \text{positive}$



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12 The zeros of the function $f(x) = x^2 - 5x - 6$ are

- (1) -1 and 6
- (2) 1 and -6
- (3) 2 and -3
- (4) -2 and 3

$(x - 6)(x + 1) = 0$

$x - 6 = 0$ $x + 1 = 0$

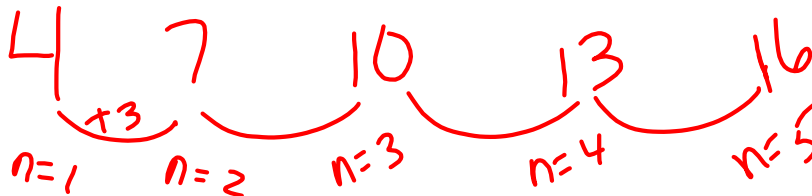
$x = 6$ $x = -1$

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13 In a sequence, the first term is 4 and the common difference is 3.

The fifth term of this sequence is

- (1) -11
- (2) -8
- (3) 16
- (4) 19



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14 The growth of a certain organism can be modeled by $C(t) = 10(1.029)^{24t}$, where $C(t)$ is the total number of cells after t hours. Which function is approximately equivalent to $C(t)$?

- (1) $C(t) = 240(.083)^{24t}$
- (2) $C(t) = 10(.083)^t$
- (3) $C(t) = 10(1.986)^t$
- (4) $C(t) = 240(1.986)^{\frac{t}{24}}$

Handwritten notes and calculations:

- $(x^2)^3 = x^6$
- $10(1.029)^{24t}$
- $10(1.029^{24})^t$

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15 A public opinion poll was taken to explore the relationship between age and support for a candidate in an election. The results of the poll are summarized in the table below.

Age	For	Against	No Opinion
21-40	30	12	8
41-60	20	40	15
Over 60	25	35	15

= 50

What percent of the 21-40 age group was for the candidate?

- (1) 15
- (2) 25
- (3) 40
- (4) 60

$$\frac{30}{50} = \frac{x}{100}$$

60%

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16 Which equation and ordered pair represent the correct vertex form and vertex for $j(x) = x^2 - 12x + 7$?

- (1) ~~$j(x) = (x - 6)^2 + 43, (6, 43)$~~
- (2) ~~$j(x) = (x - 6)^2 + 43, (-6, 43)$~~
- (3) $j(x) = (x - 6)^2 - 29, (6, -29)$
- (4) $j(x) = (x - 6)^2 - 29, (-6, -29)$

$$\left(\frac{b}{a}\right)^2$$

$$f(x) = x^2 - 12x + 36 + 7 - 36$$

$$f(x) = (x - 6)^2 - 29$$

(h, k)
(6, -29)

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17 A student invests \$500 for 3 years in a savings account that earns 4% interest per year. No further deposits or withdrawals are made during this time. Which statement does *not* yield the correct balance in the account at the end of 3 years?

- (1) $500(1.04)^3$ 562
- (2) $500(1 - .04)^3$ 442
- (3) $500(1 + .04)(1 + .04)(1 + .04)$ 562
- (4) $500 + 500(.04) + 520(.04) + 540.8(.04)$ 562

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18 The line represented by the equation $4y + 2x = 33.6$ shares a solution point with the line represented by the table below.

x	y
-5	3.2
-2	3.8
2	4.6
4	5
11	6.4

Handwritten equations:

$$y = .2x + 4.2$$

$$y = -\frac{1}{2}x + \frac{33.6}{4}$$

The solution for this system is

- (1) $(-14.0, -1.4)$
- (2) $(-6.8, 5.0)$
- (3) $(1.9, 4.6)$
- (4) $(6.0, 5.4)$

Handwritten equation:

$$.2x + 4.2 = -\frac{1}{2}x + \frac{33.6}{4}$$

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