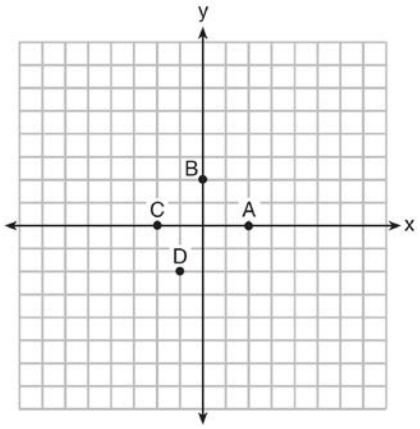
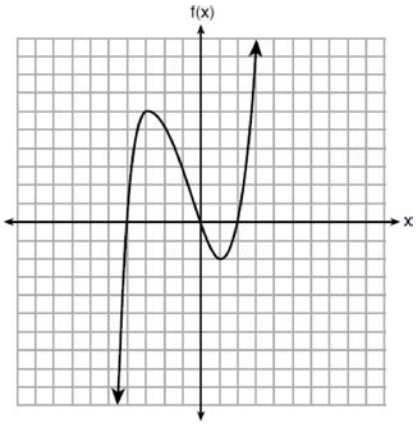
F.IF.A.2: Function Notation 1

1 The graph of $y = f(x)$ is shown below.



Which point could be used to find $f(2)$?
1) A 2) B 3) C 4) D

2 The graph of $f(x)$ is shown below.



What is the value of $f(-3)$?
1) 6 2) 2 3) -2 4) -4

3 If $f(x) = 4x + 5$, what is the value of $f(-3)$?
1) -2 2) -7 3) 17 4) 4

4 If $f(x) = \frac{3x+4}{2}$, then $f(8)$ is
1) 21 2) 16 3) 14 4) 4

5 Given $f(x) = -3x^2 + 10$, what is the value of $f(-2)$?
1) -26 2) -2 3) 22 4) 46

6 If $g(x) = -2x^2 + 16$ then $g(-3)$ equals
1) -20 2) -2 3) 34 4) 52

7 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

8 A function is defined as $h(x) = x^2 - 3x + 1$. What is the value of $h(-1)$?
1) 1 2) 2 3) 3 4) 5

9 If $g(x) = -x^2 - x + 5$, then $g(-4)$ is equal to
1) -15 2) -7 3) 17 4) 25

10 A function is defined as $K(x) = 2x^2 - 5x + 3$. The value of $K(-3)$ is
1) 54 2) 36 3) 0 4) -18

11 If $f(x) = \frac{1}{2}x^2 - \left(\frac{1}{4}x + 3\right)$, what is the value of $f(8)$?
1) 11 2) 17 3) 27 4) 33

12 If $f(x) = \sqrt{x+1} + 5$, then what is the value of $f(3)$?
1) 9 2) 7 3) 3 4) 10

13 If $k(x) = 2x^2 - 3\sqrt{x}$, then $k(9)$ is
1) 315 2) 307 3) 159 4) 153

14 If $f(x) = 2(3^x) + 1$, what is the value of $f(2)$?
1) 13 2) 19 3) 37 4) 54

15 If $f(x) = \frac{\sqrt{2x+3}}{6x-5}$, then $f\left(\frac{1}{2}\right) =$
1) 1 2) -2 3) -1 4) $-\frac{13}{3}$

16 Given the function $g(x) = \frac{2^{x+3}}{x^2-2}$, what is the value of $g(-2)$?
1) 1 2) $\frac{1}{3}$ 3) -1 4) $-\frac{1}{3}$

17 If $f(x) = x^2 + 2x + 1$ and $g(x) = 3x + 5$, then what is the value of $f(1) - g(3)$?
1) 10 2) 8 3) -10 4) -8

18 Given $f(x) = 3x - 5$, which statement is true?
1) $f(0) = 0$ 2) $f(3) = 4$ 3) $f(4) = 3$ 4) $f(5) = 0$

19 If $f(n) = (n-1)^2 + 3n$, which statement is true?
1) $f(3) = -2$ 2) $f(-2) = 3$ 3) $f(-2) = -15$ 4) $f(-15) = -2$

20 If $f(x) = x^2 + 3x$, then which statement is true?
1) $f(1) = f(-1)$ 2) $f(2) = f(-2)$ 3) $f(1) = f(2)$ 4) $f(-1) = f(-2)$

21 Lynn, Jude, and Anne were given the function $f(x) = -2x^2 + 32$, and they were asked to find $f(3)$. Lynn's answer was 14, Jude's answer was 4, and Anne's answer was ±4. Who is correct?
1) Lynn, only 2) Jude, only 3) Anne, only 4) Both Lynn and Jude

22 The value in dollars, $v(x)$, of a certain car after x years is represented by the equation $v(x) = 25,000(0.86)^x$. To the *nearest dollar*, how much more is the car worth after 2 years than after 3 years?
1) 2589 2) 6510 3) 15,901 4) 18,490

23 If $f(x) = \frac{-3x-5}{2}$, algebraically determine the value of x when $f(x) = -22$.

24 If $g(x) = -4x^2 - 3x + 2$, determine $g(-2)$.

25 Given $g(x) = x^3 + 2x^2 - x$, evaluate $g(-3)$.

26 If $f(x) = \frac{30x^2}{x+2}$, determine the value of $f\left(\frac{1}{2}\right)$.

27 The piecewise function $f(x)$ is given below.

$$f(x) = \begin{cases} 2x - 3, & x > 3 \\ -x^2 + 15, & x \le 3 \end{cases}$$

State the value of $f(3)$. Justify your answer.

28 The equation to determine the weekly earnings of an employee at The Hamburger Shack is given by $w(x)$, where x is the number of hours worked.

$$w(x) = \begin{cases} 10x, & 0 \le x \le 40 \\ 15(x-40) + 400, & x > 40 \end{cases}$$

Determine the difference in salary, *in dollars*, for an employee who works 52 hours versus one who works 38 hours. Determine the number of hours an employee must work in order to earn $445. Explain how you arrived at this answer.

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Answer Section

1 ANS: 1 REF: 061420ai
2 ANS: 1 REF: 081805ai
3 ANS: 2
$f(-3) = -12 + 5 = -7$

REF: 061902ai
4 ANS: 3
$f(8) = \frac{3(8)+4}{2} = \frac{28}{2} = 14$

REF: 082201ai
5 ANS: 2
$f(-2) = -3(-2)^2 + 10 = -12 + 10 = -2$

REF: 012304ai
6 ANS: 2
$g(-3) = -2(-3)^2 + 16 = -18 + 16 = -2$

REF: 082503ai
7 ANS: 1
$g(-3) = -2(-3)^2 + 3(-3) = -18 - 9 = -27$

REF: 011902ai
8 ANS: 4
$h(-1) = (-1)^2 - 3(-1) + 1 = 5$

REF: 062610ai
9 ANS: 2
$g(-4) = -(-4)^2 - (-4) + 5 = -7$

REF: 062311ai
10 ANS: 2
$K(-3) = 2(-3)^2 - 5(-3) + 3 = 18 + 15 + 3 = 36$

REF: 062103ai
11 ANS: 3
$f(8) = \frac{1}{2}(8)^2 - \left(\frac{1}{4}(8) + 3\right) = 32 - 5 = 27$

REF: 081704ai

12 ANS: 2

$f(3) = \sqrt{3+1} + 5 = 7$

REF: 012614ai

13 ANS: 4

$k(9) = 2(9)^2 - 3\sqrt{9} = 162 - 9 = 153$

REF: 061802ai

14 ANS: 2

$f(2) = 2(3^2) + 1 = 19$

REF: 012001ai

15 ANS: 3

$$\frac{\sqrt{2\left(\frac{1}{2}\right)+3}}{6\left(\frac{1}{2}\right)-5} = \frac{\sqrt{4}}{-2} = \frac{2}{-2} = -1$$

REF: 081512ai

16 ANS: 1

$$g(-2) = \frac{2^{(-2)+3}}{(-2)^2 - 2} = \frac{2^1}{4-2} = 1$$

REF: 062518ai

17 ANS: 3

$f(1) = 1^2 + 2(1) + 1 = 4$

$g(3) = 3(3) + 5 = 14$

$f(1) - g(3) = -10$

REF: 012410ai

18 ANS: 2

$f(3) = 3(3) - 5 = 4$

REF: 062202ai

19 ANS: 2

$f(-2) = (-2-1)^2 + 3(-2) = 9 - 6 = 3$

REF: 081605ai

20 ANS: 4

$f(-1) = f(-2) = -2$

REF: 082318ai

21 ANS: 1

$f(3) = -2(3)^2 + 32 = -18 + 32 = 14$

REF: 061705ai

22 ANS: 1

$25{,}000(0.86)^2 - 25{,}000(0.86)^3 = 18490 - 15901.40 = 2588.60$

REF: 011508ai

23 ANS:

$-22 = \dfrac{-3x - 5}{2}$

$-44 = -3x - 5$

$-39 = -3x$

$13 = x$

REF: 012529ai

24 ANS:

$g(-2) = -4(-2)^2 - 3(-2) + 2 = -16 + 6 + 2 = -8$

REF: 081925ai

25 ANS:

$g(-3) = (-3)^3 + 2(-3)^2 - (-3) = -27 + 18 + 3 = -6$

REF: 062426ai

26 ANS:

$$f\left(\frac{1}{2}\right) = \frac{30\left(\frac{1}{2}\right)^2}{\frac{1}{2} + 2} = \frac{\frac{30}{4}}{\frac{5}{2}} = \frac{15}{2} \times \frac{2}{5} = 3$$

REF: 082426ai

27 ANS:

$f(3) = -(3)^2 + 15 = 6$

REF: 012430ai

28 ANS:

$w(52) - w(38)$ $\quad 15(x - 40) + 400 = 445$ Since $w(x) > 400$, $x > 40$. I substituted 445 for $w(x)$ and solved for x.

$15(52 - 40) + 400 - 10(38)$ $\quad 15(x - 40) = 45$

$180 + 400 - 380$ $\quad x - 40 = 3$

200 $\quad x = 43$

REF: 061534ai