

**F.IF.A.2: Functional Notation 2a**

1 If  $f(x) = |x^3 - 3|$ , then  $f(-1)$  is equivalent to

- 1) 0
- 2) 2
- 3) -2
- 4) 4

2 If  $f(x) = \frac{x}{x^2 - 16}$ , what is the value of  $f(-10)$ ?

- 1)  $-\frac{5}{2}$
- 2)  $-\frac{5}{42}$
- 3)  $\frac{5}{58}$
- 4)  $\frac{5}{18}$

3 If  $f(x) = x^2 - 3$ , then  $f(a - b)$  is equivalent to

- 1)  $a^2 - b^2 - 3$
- 2)  $a^2 - 2ab - b^2 - 3$
- 3)  $a^2 - 2ab + b^2 - 3$
- 4)  $a^2 + b^2 - 3$

4 If  $f(x) = 4x^2 - x + 1$ , then  $f(a + 1)$  equals

- 1)  $4a^2 - a + 6$
- 2)  $4a^2 - a + 4$
- 3)  $4a^2 + 7a + 6$
- 4)  $4a^2 + 7a + 4$

5 If  $f(x) = 2x^2 - 3x + 4$ , then  $f(x + 3)$  is equal to

- 1)  $2x^2 - 3x + 7$
- 2)  $2x^2 - 3x + 13$
- 3)  $2x^2 + 9x + 13$
- 4)  $2x^2 + 9x + 25$

6 If  $f(x) = \frac{x-4}{x+4}$ , then  $f(4a)$  equals

- 1)  $\frac{a-1}{a+1}$
- 2)  $\frac{a+1}{a-1}$
- 3)  $\frac{4a-1}{4a+1}$
- 4)  $\frac{4a+1}{4a-1}$

7 If  $f(x) = \frac{x-2}{x+1}$ , then  $f(n+1)$  is equal to

- 1)  $-\frac{1}{2}$
- 2)  $\frac{n+1}{n-2}$
- 3)  $\frac{n-1}{n+2}$
- 4)  $\frac{n-2}{n+1}$

8 If  $f(x) = kx^2$ , and  $f(2) = 12$ , then  $k$  equals

- 1) 1
- 2) 2
- 3) 3
- 4) 4

9 A model rocket is launched into the air from ground level. The height, in feet, is modeled by  $p(x) = -16x^2 + 32x$ , where  $x$  is the number of elapsed seconds. What is the total number of seconds the model rocket will be in the air?

- 1) 1
- 2) 2
- 3) 0
- 4) 16

- 10 The height,  $f(x)$ , of a bouncing ball after  $x$  bounces is represented by  $f(x) = 80(0.5)^x$ . How many times higher is the first bounce than the fourth bounce?  
1) 8  
2) 2  
3) 16  
4) 4
- 11 A population,  $p(x)$ , of wild turkeys in a certain area is represented by the function  $p(x) = 17(1.15)^{2x}$ , where  $x$  is the number of years since 2010. How many more turkeys will be in the population for the year 2015 than 2010?  
1) 46  
2) 49  
3) 51  
4) 68
- 12 For which equation will  $f(-2) = -6$ ?  
1)  $f(x) = x^3 + x$   
2)  $f(x) = x^4 - 5x$   
3)  $f(x) = 4x^3 + 6x^2 - x$   
4)  $f(x) = -3x^3 - 4x^2 + 4x$
- 13 Given: the function  $f$  defined by  $f(x) = 3x^2 - 4$ . Which statement is true?  
1)  $f(0) = 0$   
2)  $f(-2) = f(2)$   
3)  $f(5) + f(2) = f(7)$   
4)  $f(5) - f(2) = f(10)$
- 14 If  $f(x) = (2x)^2$ , find  $f(-4)$ .
- 15 If  $f(x) = x^2 - 3x$ , find  $f(-1.8)$ .
- 16 If  $f(x) = 3 - x^2$ , find  $f(-2)$ .
- 17 If  $f(x) = -2x^2 + 6$ , find the value of  $f(-3)$ .
- 18 If  $f(x) = x^2 - 2x + 3$ , find the value of  $f(-2)$ .
- 19 If  $f(x) = x^2 + 3x - 5$ , find the value of  $f(3)$ .
- 20 If  $f(x) = x^3 - 2x$ , find  $f(-2)$ .
- 21 If  $f(x) = 2x^3 + 4x^2$ , find  $f(-3)$ .
- 22 If  $f(x) = 3x - 4$  and  $g(x) = x^2$ , find the value of  $f(3) - g(2)$ .
- 23 If  $f(x) = \sqrt{25 - x^2}$ , find  $f(3)$ .
- 24 If  $f(x) = \sqrt{29 - x^2}$ , find  $f(-2)$ .
- 25 If  $g(x) = \left(ax\sqrt{1-x}\right)^2$ , express  $g(10)$  in simplest form.
- 26 A population of wolves in a county is represented by the equation  $P(t) = 80(0.98)^t$ , where  $t$  is the number of years since 1998. Predict the number of wolves in the population in the year 2008.

## F.IF.A.2: Functional Notation 2a

### Answer Section

1 ANS: 4 REF: 019020siii

2 ANS: 2

$$f(10) = \frac{-10}{(-10)^2 - 16} = \frac{-10}{84} = -\frac{5}{42}$$

REF: 061102a2

3 ANS: 3 REF: 089525siii

4 ANS: 4

$$\begin{aligned} f(a+1) &= 4(a+1)^2 - (a+1) + 1 \\ &= 4(a^2 + 2a + 1) - a \\ &= 4a^2 + 8a + 4 - a \\ &= 4a^2 + 7a + 4 \end{aligned}$$

REF: 011527a2

5 ANS: 3

$$f(x+3) = 2(x+3)^2 - 3(x+3) + 4 = 2x^2 + 12x + 18 - 3x - 9 + 4 = 2x^2 + 9x + 13$$

REF: 011619a2

6 ANS: 1 REF: 019517siii

7 ANS: 3 REF: 018616siii

8 ANS: 3 REF: 018915siii

9 ANS: 2

$$\begin{aligned} -16x^2 + 32x &= 0 \\ -16x(x-2) &= 0 \\ x &= 0, 2 \end{aligned}$$

REF: 011524ia

10 ANS: 1

$$\begin{aligned} 80(0.5)^1 &= 40 \\ 80(0.5)^4 &= 5 \end{aligned}$$

REF: 060607b

11 ANS: 3

$$p(5) - p(0) = 17(1.15)^{2(5)} - 17(1.15)^{2(0)} \approx 68.8 - 17 \approx 51$$

REF: 061527a2

12 ANS: 3

$$f(-2) = 4(-2)^3 + 6(-2)^2 - (-2) = -32 + 24 + 2 = -6$$

REF: 061608a2

13 ANS: 2

REF: 089422siii

14 ANS:

64

REF: 069801siii

15 ANS:

8.64

REF: 019904siii

16 ANS:

-1

REF: 068602siii

17 ANS:

-12

REF: 088603siii

18 ANS:

11

REF: 088501siii

19 ANS:

13

REF: 018701siii

20 ANS:

-4

REF: 068702siii

21 ANS:

-18

REF: 010303siii

22 ANS:

1

REF: 080001siii

23 ANS:

4

REF: 069601siii

24 ANS:

5

REF: 060102siii

25 ANS:

$$g(10) = \left( a(10)\sqrt{1-10} \right)^2 = 100a^2(-9) = -900a^2$$

REF: 061333a2

26 ANS:

$$65. P(10) = 80(0.98)^{10} \approx 65$$

REF: 060721b