F.IF.A.2: Functional Notation 2b

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

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

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

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

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

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

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

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

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?

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?

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?

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 2b
Answer Section

1 ANS:
    4

    REF: 019020siii
2 ANS:
    $-\dfrac{5}{42}$

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

    REF: 061102a2
3 ANS:
    $a^2 - 2ab + b^2 - 3$

    REF: 089525siii
4 ANS:
    $4a^2 + 7a + 4$
    $f(a+1) = 4(a+1)^2 - (a+1) + 1$

    $\qquad\qquad = 4(a^2 + 2a + 1) - a$

    $\qquad\qquad = 4a^2 + 8a + 4 - a$

    $\qquad\qquad = 4a^2 + 7a + 4$

    REF: 011527a2
5 ANS:
    $2x^2 + 9x + 13$
    $f(x+3) = 2(x+3)^2 - 3(x+3) + 4 = 2x^2 + 12x + 18 - 3x - 9 + 4 = 2x^2 + 9x + 13$

    REF: 011619a2
6 ANS:
    $\dfrac{a-1}{a+1}$

    REF: 019517siii
7 ANS:
    $\dfrac{n-1}{n+2}$

    REF: 018616siii
8 ANS:
    3

    REF: 018915siii

9 ANS:
   2
   $-16x^2 + 32x = 0$
   $-16x(x-2) = 0$
                $x = 0, 2$

   REF: 011524ia
10 ANS:
    8
    $80(0.5)^1 = 40$
    $80(0.5)^4 = 5$

    REF: 060607b
11 ANS:
    51
    $p(5) - p(0) = 17(1.15)^{2(5)} - 17(1.15)^{2(0)} \approx 68.8 - 17 \approx 51$

    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