F.IF.A.2: Functional Notation 2

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 2
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

$$f(a+1) = 4(a+1)^2 - (a+1) + 1$$
$$= 4(a^2 + 2a + 1) - a$$
$$= 4a^2 + 8a + 4 - a$$
$$= 4a^2 + 7a + 4$$

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

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

REF: 011524ia

10 ANS: 1

$$80(0.5)^1 = 40$$
$$80(0.5)^4 = 5$$

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