# Functions. Form A

1. Given $\sqrt{x^3} - 1$, what is $f(2)$?

(A) $\sqrt{7}$
(B) $\sqrt{8} - 1$
(C) 7
(D) $\sqrt{2} - 1$
(E) $2\sqrt{3}$

2. Given $f(x) = \sqrt{x^2 + 1}$, $g(x) = 3x$. What is $f\big(g(x)\big)$?
(A) $3x + 1$
(B) $\sqrt{3x} + 1$
(C) 10
(D) $\sqrt{9x^2 + 1}$
(E) $\sqrt{18x^2 + 1}$

3. Given $f(x) = |1 - x|$, $g(x) = 5x$. What is $f\big(g(-2)\big)$?
(A) 9
(B) $-9$
(C) 11
(D) $-11$
(E) 10

4. Given $f(x)$ $below$. What is $f(3)$?
(A) 9
(B) $-9$
(C) 8
(D) 17
(E) Undefined

$$f(x) = \begin{cases} 3x - 1 & -5 \le x < 0 \\ x^2 & 0 \le x \le 7 \end{cases}$$

5. Given $f(x)$ $below$. What is $f(0)$?

(A) $-5$
(B) $-1$
(C) 1
(D) $\sqrt{8}$
(E) undefined

$$f(x) = \begin{cases} x-1 & -5 \le x < 0 \\ \sqrt{x+1} & 0 \le x \le 7 \end{cases}$$

6. Given that the function $f$ is defined as $f(x) = 3 - 2x$. If the domain of the function is given by $\{-1,0,2\}$, What is the range of function $f$?

(A) $\{1,3,-1\}$
(B) $\{-1,0,-1\}$
(C) $\{5,0,5\}$
(D) $\{-1,0,2\}$
(E) $\{5,3,-1\}$

7. Given that the function $f$ is defined as $f(x) = \frac{2}{1-2x}$. What is the domain of function $f$?

(A) $x \neq \frac{1}{2}$
(B) $x = \frac{1}{2}$
(C) $x = 0$
(D) $x \neq 0$
(E) undefined

8. Given that the function $f$ is defined as $f(x) = \sqrt{x-1}$. What is the domain of function $f$?

(A) $x = 1$
(B) $x \neq 1$
(C) $x \geq 1$
(D) $x < 1$
(E) undefined

9. In the standard $(x, y)$coordinate plane, what is the y-intercept of the graph of the function $f(x) = 2x - 5$?

(A) 0
(B) $-7$
(C) 2
(D) $-5$
(E) 5

10. The function $f$ is defined by the table below. What is $f(-1) + f(3)$?

| x | -2 | -1 | 0 | 1 | 2 | 3 |
|---|---|---|---|---|---|---|
| f(x) | 4 | 1 | 0 | 1 | 4 | 9 |

(A) 2
(B) $8$
(C) 13
(D) $-5$
(E) 10

11. The function $f$ is defined by the table below. What is the domain of the function?

| x | -2 | -1 | 0 | 1 | 2 |
|---|---|---|---|---|---|
| f(x) | 4 | 1 | 0 | 1 | 4 |

(A) $\{-2,4, -1,1,0,0,1,1,2,4\}$
(B) $(4,1,0,1,4\}$
(C) $\{-2,4\}$
(D) $\{-2, -1,0,1,2\}$
(E) [-2,4]

12. The function $f$ is defined by the table below. What is the range of the function?

| x | 0 | 1 | 2 | 3 |
|---|---|---|---|---|
| f(x) | -2 | 0 | 2 | 4 |

(A) ) $\{0,1,2,3\}$
(B) ) $\{-2,0,2,4\}$
(C) ) $\{0,4\}$

(D) [0,4]
(E) ) $\{0,-2,3,4\}$

13. What are the amplitude and period of the function $f(t) = 2\cos\left(\frac{1}{2}t\right)$?
(A) Amplitude is 2, Period is $\frac{\pi}{2}$
(B) Amplitude is 2, Period is $4\pi$
(C) Amplitude is 2, Period is $2\pi$
(D) Amplitude is 1, Period is $4\pi$
(E) Amplitude is 2, Period is $\frac{\pi}{2}$

14. The function $f(x) = x^2$ is a parabola in the standard $(x,y)$ coordinate plane with vertex at the origin and it opens upward. What is the equation of the parabola if it's shifted up by 2 units and to the right by 3 units?

(A) $f(x) = (x-2)^2 + 3$
(B) $f(x) = (x+2)^2 - 3$
(C) $f(x) = (x-3)^2 + 2$
(D) $f(x) = (x+3)^2 + 2$
(E) $f(x) = (x-3)^2 - 2$

15. The function $f(x) = (x+2)^2 + 2$ is a parabola in the standard $(x,y)$ coordinate plane. What is the vertex if the parabola is reflected about the x-axis?

(A) $(-2,-2)$
(B) $(2,-2)$
(C) $(-2,2)$
(D) $(-2,-2)$
(E) $(0,-2)$

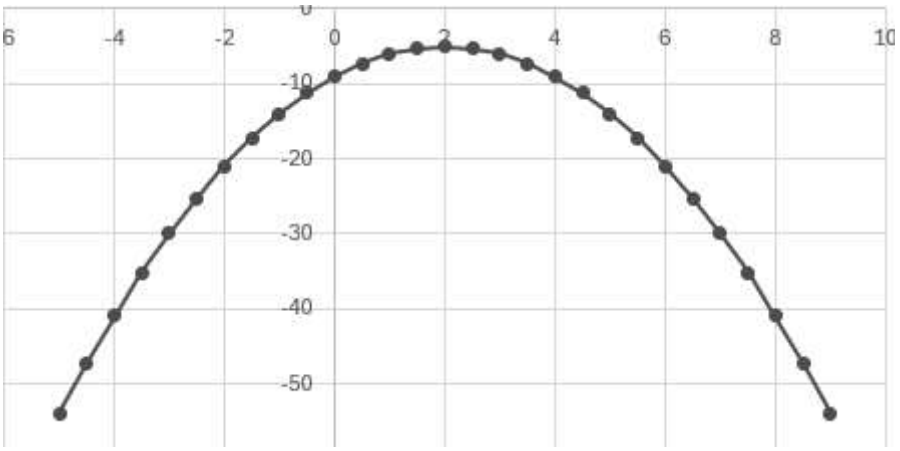
16. The function $f$ and $g$ is defined by the table below. What $is\ f\big(g(2)\big)$?

| x | 0 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| f(x) | -2 | 0 | 2 | 4 | 6 | 8 |
| g(x) | 0 | 1 | 4 | 9 | 16 | 25 |

(A) 2
(B) 6

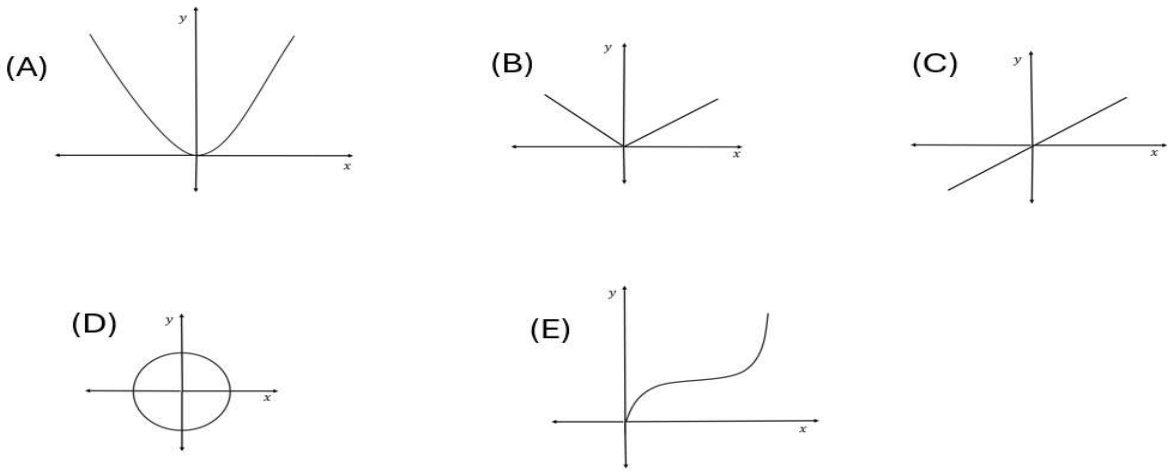
(C) 16
(D) 8
(E) 4

17. The graph of a function a parabola in the standard $(x, y)$ coordinate plane is given below. The graph is represented by which equation?




(A) $f(x) = (x-2)^2 - 10$
(B) $f(x) = (x+2)^2 - 5$
(C) $f(x) = -(x-2)^2 - 5$
(D) $f(x) = -(x-10)^2 - 5$
(E) $f(x) = -(x+2)^2 - 5$

18. Which of the graphs below in the standard $(x, y)$ plane coordinate is NOT a function?



19. For $f(x) = 2x + 1$, what is $f(x + h)$?

(A) $2x + 2h + 1$
(B) $0$
(C) $2x + h + 1$
(D) $x + h + 1$
(E) $2x^2 + 2h^2 + 1$

20. What is the period of the function $f(t) = 2\sin(t + 3)$ in degrees?

(A) 90°
(B) 180°
(C) 270°
(D) 45°
(E) 360°

1. B
2. D
3. C
4. A
5. C
6. E
7. A
8. C
9. D
10. E
11. D
12. B
13. B
14. C
15. D
16. B
17. C
18. D
19. A
20. E