Unit: 3 – Modeling and Analyzing Quadratic Functions

1.   What is the correct factored form for $f(x) = x^2 + 4x - 32$?

DOK:
1

    A. (x + 8)(x – 4)   B.   (x – 8)(x + 4)

    C. (x + 16)(x – 2)   D.   (x + 16)(x – 16)

2.   Which statement best describes the graph of $f(x) = (x - 2)^2 + 4$

DOK:
1

    A. Shifted right two, shifted up 4   B.   Shifted left 2, shifted up 4

    C. Shifted right 4, shifted down 2   D.   Shifted left 4, shifted up 2

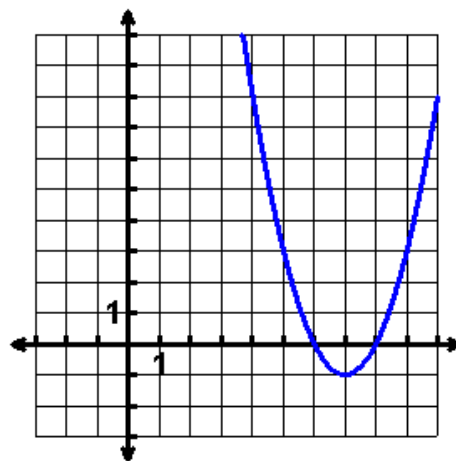3.   Use the quadratic formula to solve: $x^2 - 10x + 18 = 0$.

DOK:
1

    A. $10 \pm 2\sqrt{7}$ B. $5 \pm \sqrt{7}$

    C. $-10 \pm 2\sqrt{7}$ D.   No Solution

4.   Solve $x^2 + 6x - 7 = 0$

DOK:
1

    A. {-7, -1}   B.   {7, 1}

    C. {7, -1}   D.   {-7, 1}

5.   What is the range of the following graph:

DOK:
1

    A.   All real numbers   B. y > -1

    C. x > -1   D. y < - 1

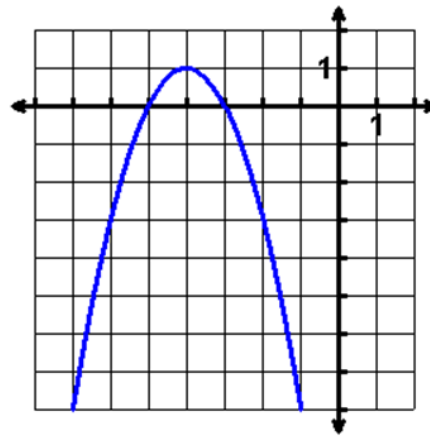6.   For which quadratic equation is the axis of symmetry x = 3?

DOK:
1

    A. $y = -x^2 + 3x + 5$ B. $y = x^2 + 6x + 3$

    C. $y = -x^2 + 6x + 2$ D. $y = x^2 + x + 3$

7. What is/are the solution/s to the following graph?

DOK:
1

A. (-3, 1)

B. All real numbers

C. No solution

D. (-5, 0), (-3, 0)

8. Solve: $x^2 + 7x = 1$

DOK:
1

A. $x = \frac{-7 \pm \sqrt{53}}{2}$

B. $x = \frac{7 \pm \sqrt{53}}{2}$

C. $x = 7 \pm \sqrt{53}$

D. $x = -7 \pm \sqrt{53}$

9. Find the vertex for: $f(x) = x^2 - 2x - 8$

DOK:
1

A. (-1, -9)

B. (1, -9)

C. (9, 1)

D. (-9, 1)

10. The height, y, in feet, a ball will reach when thrown in the air is given by the equation $y = -16x^2 + 30x + 6$. Find to the nearest tenth, the maximum height, in feet, the ball will reach.

DOK:
2

A. 39.3 feet

B. 33.2 feet

C. 19.9 feet

D. 20.1 feet

11. Find and interpret the discriminant for: $3r^2 - 5r = -8r + 2$

DOK:
2

A. 33; two irrational solutions

B. 36; two rational solutions

C. 0; one rational solution

D. No solution

12. What is the rate of change on the interval $3 < x < 5$ for $f(x) = -x^2 + 6x - 7$?

DOK:
2

A. m = 0

B. $m = -\frac{1}{2}$
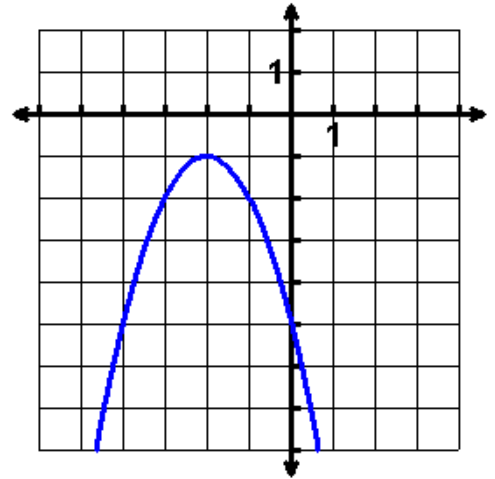
C. m = -2

D. $m = \frac{1}{2}$

13. A rocket is shot into the air with an initial velocity of 800 m/sec. The equation $h = -16t^2 + 1440t$ models the height of the rocket. How long does it take for the rocket to hit the ground?

DOK: 2

    A. 90 seconds

    C. 800 seconds

    B. 16 seconds

    D. 1440 seconds

14. What is the interval of decrease for the following graph:

DOK: 1

    A. $-\infty < x < -5$

    C. $-\infty < x < -2$

    B. $-2 < x < \infty$

    D. $-1 < x < \infty$

15. Which statement BEST describes how the graph of $g(x) = \frac{1}{2}x^2 + 2$ compares to the graph of $f(x) = x^2$?

DOK: 1

    A. The graph of g(x) is a vertical shrink of f(x) by a factor of 2.

    C. The graph of g(x) is a vertical shrink of f(x) by a factor of $\frac{1}{2}$.

    B. The graph of g(x) is a vertical stretch of f(x) by a factor of $\frac{1}{2}$.

    D. The graph of g(x) is a vertical stretch of f(x) by a factor of 2.

16. Abigail tosses a coin off a bridge into the stream below. The distance, in feet, the coin is above the water is modeled by the equation $f(x) = -16x^2 + 96x + 112$. X represents time in seconds. What is the maximum height of the coin?

DOK: 2

    A. 275 feet

    C. 245 feet

    B. 300 feet

    D. 256 feet

17. If a toy rocket is launched vertically upward from ground level with an initial velocity of 128 feet per second, then its height h after t seconds is given by the equation $f(t) = -16t^2 + 128t$ (if air resistance is neglected). After how many seconds will the rocket be 192 feet above the ground?

DOK: 2

    A. 4 seconds

    C. 5 seconds

    B. 3 seconds

    D. 6 seconds

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18. Use this table to answer the question. What is the average rate of change of g(x) over the interval -1 < f(x) < 2?

DOK: 1

x	g(x)
-1	-4
0	-4
1	0
2	8

A. 3   B. 4

C. -4   D. 6

19. What is the end behavior of the graph of $f(x) = -2x^2 + 2x - 4$?

DOK: 1

A. As x increases, f(x) increases
   As x decreases, f(x) decreases

B. As x increases, f(x) decreases
   As x decreases, f(x) increases

C. As x increases, f(x) increases
   As x decreases, f(x) increases

D. As x increases, f(x) decreases
   As x increases, f(x) decreases

20. Compare the graph of f(x) to the function $g(x)4x^2 + 6x - 18$. Which function has the lesser minimum value? <u>HOW DO YOU KNOW</u>?

DOK: 3

f(x)

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ANSWERS:

1) A	11) A
2) A	12) C
3) B	13) A
4) D	14) B
5) B	15) C
6) C	16) D
7) D	17) C
8) A	18) B
9) B	19) D
10) D	20) g(x), The minimum is the y-value of the vertex. The vertex of the graph f(x) is (2, -18). Use $x = -\frac{b}{2a}$ to find the vertex of g(x), which is (-,75, -20.25). -20.25 < -18, so the function g(x) has the lesser minimum value.