Algebra 1 STAAR EOC Review #10
Reporting Category 5: Quadratic and Other Nonlinear Functions
A.10ab, A.11ac

RC5 A.10A

1. What is the solution set for the equation $4(3x - 2)^2 = 36$?

    A. $\left(-\dfrac{11}{6}, \dfrac{11}{6}\right)$

    B. $\left(-\dfrac{11}{3}, \dfrac{11}{3}\right)$

    C. $\left(-\dfrac{1}{3}, \dfrac{5}{3}\right)$

    D. $\left(-\dfrac{2}{3}, \dfrac{4}{3}\right)$

2. The completion of a certain chemical reaction is expressed by the equation $y = 250 - 5x - x^2$, where y is the number of seconds needed to complete the reaction and x is the temperature in degrees Celsius at which the reaction occurs. If the reaction is complete in 200 seconds, what is the temperature at which the reaction occurs?

    F. 5ºC
    G. 7ºC
    H. 10ºC
    J. 12ºC

3. What are the zeros of the function
    $$y = \frac{1}{2}(x+4)(x-6)\ ?$$

    A. -4 and 6
    B. -3 and 2
    C. 4 and -6
    D. -2 and 3

4. What are the solutions to the quadratic equation $2n^2 = 5n + 7$?

    F. $n = -3.5$ and $n = -1$
    G. $n = -1$ and $n = 3.5$
    H. $n = 3.5$ and $n = 1$
    J. $n = 1$ and $n = -3.5$

5. Nancy threw a ball upward from the roof of a 50-foot-high building at an initial velocity of 40 feet per second. The table shows the relationship between the time elapsed and the ball's height above the ground.

Time After Nancy Threw the Ball (seconds)	Height of the Ball Above the Ground (feet)
0	50
0.5	66
1.0	74
1.5	74
2.0	66
2.5	50

    If the height of the ball is a quadratic function of time, between what times did the ball reach a height of 70 feet?

    A. Between 0 seconds and 0.5 second
    B. Between 1 second and 1.5 seconds
    C. Between 0.5 second and 1 second and between 1.5 seconds and 2 seconds
    D. Between 1 second and 1.5 seconds and between 1.5 seconds and 2 seconds.

6. What is the solution set for the equation $4n^2 - 9 = 23$?

    F. $\left\{-\sqrt{3.5}, \sqrt{3.5}\right\}$
    G. $\left\{-4\sqrt{2}, 4\sqrt{2}\right\}$
    H. $\left\{-2\sqrt{2}, 2\sqrt{2}\right\}$
    J. $\left\{-4, 4\right\}$

7. What is the solution set for the equation $n^2 - 9 = 27$?

    A. $\left\{-3\sqrt{2}, 3\sqrt{2}\right\}$
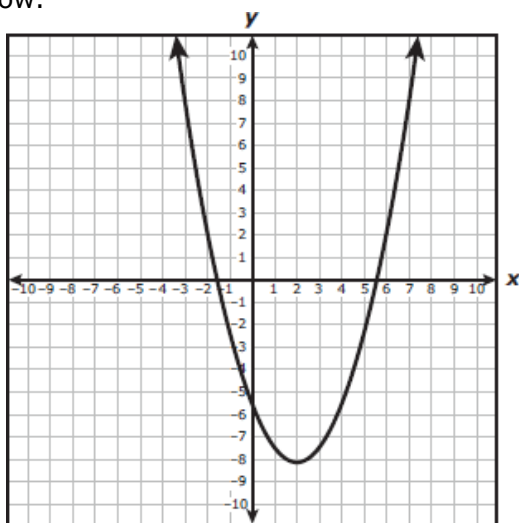   B. $\left\{-6, 6\right\}$
    C. $\left\{-18, 18\right\}$

8. When the quadratic function $y = x^2 - 8x + 15$ is graphed, at what coordinates does the graph intersect the x-axis?

   F. $(0, -5)$ and $(0, -3)$
   G. $(4, 0)$ and $(15, 0)$
   H. $(3, 0)$ and $(5, 0)$

9. The graph of a quadratic function is shown below.

   What is the best estimate of the positive value of x for which this function equals 8?

   A. 2
   B. 4
   C. 13
   D. 7

10. What is the solution set for the equation $2x^2 - 16x - 96 = 0$?

   F. {4, 12}
   G. {-4, 12}
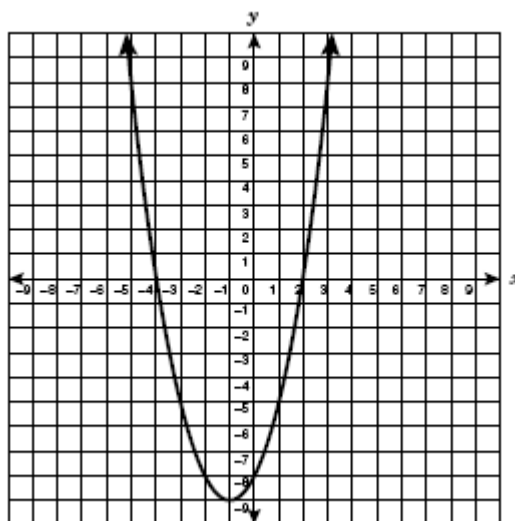   H. {-4, -12}
   J. {4, -12}

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11. What are the x-intercepts of the graph of the equation $y = x^2 + x - 12$?

   A. $x = 4, x = 3$
   B. $x = -4, x = 3$
   C. $x = -4, x = -3$
   D. $x = 4, x = -3$

12. What are the roots of the quadratic equation $x^2 - 3x + 2 = 0$?
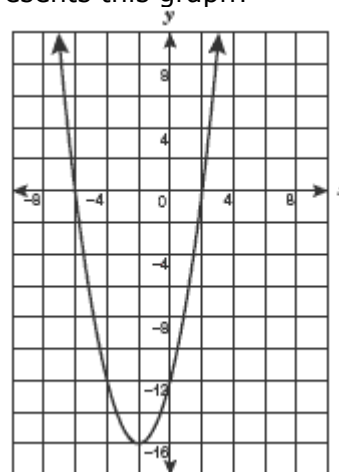
   F. -2 and -1
   G. -2 and 1
   H. 2 and -1
   J. 2 and 1

13. What are the roots of the function graphed below?
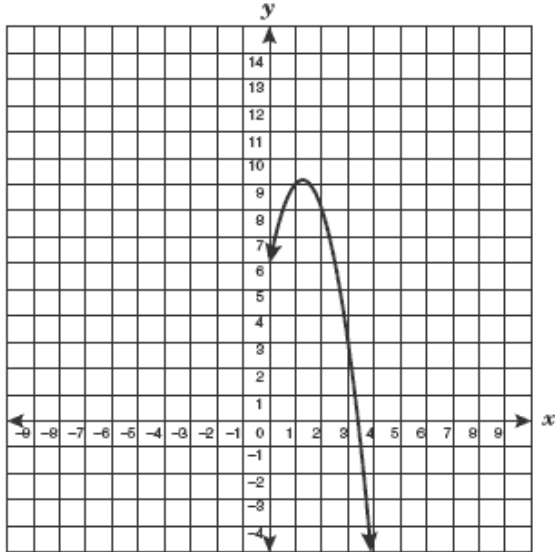

   A. $(-1, -9)$ and $(0, -8)$
   B. $(0, -4)$ and $(2, 0)$
   C. $(-4, 0)$ and $(2, 0)$
   D. $(0, 2)$ and $(0, -4)$

14. Which of the following polynomial equations best represents this graph?
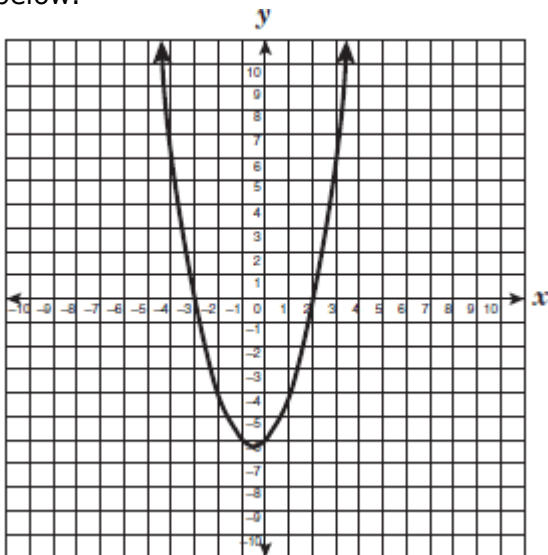

   F. $(x + 6)(x - 2) = y$
   G. $(x - 2)(x - 16) = y$
   H. $(x - 6)(x + 2) = y$
   J. $(x + 2)(x + 16) = y$

15. Part of the graph of a quadratic equation is shown below.

If the line of symmetry for this quadratic equation is x=1.25, between which two integers will the other part of the graph intersect the x- axis?

A. -4 and -3
B. -3 and -2
C. -2 and -1
D. -1 and 0

16. The graph of $f(x) = x^2 + x - 6$ is shown below.

Which of the following is a zero of this function?

F. -6
G. 3
H. -2
J. 2

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17. Which expression describes the area in square units of a rectangle that has a width of $4x^3y^2$ and a length of $3x^2y^3$?

A. $12x^6y^6$
B. $12x^5y^5$
C. $7x^6y^6$
D. $7x^5y^5$

18. The area of a rectangle is $144a^8b^4$ square units. If the width of the rectangle is $8a^2b^2$ units, what is the length in units?

F. $18a^6b^2$ units
G. $136a^6b^2$ units
H. $152a^{10}b^6$ units
J. $1152a^{10}b^6$ units

19. If $y = x^3$, what is equivalent to x^{12}?

A. y^{36}
B. y^{15}
C. y^9
D. y^4

20. Which expression is equivalent to $\dfrac{(8x^3)(2x^5)}{4x^6}$?

F. $4x^9$
G. $4x^2$
H. $2x^8$
J. $2x^4$

21. Marlena was asked to find an expression that is not equivalent to 2^{12}. Which of the following is not equivalent to the given expression?

A. $(2^2)^6$
B. $(2^8)^4$
C. $(2^6)(2^6)$
D. $(2^3)(2^9)$

22. Which expression is equivalent to $(-5abc^4)(-3a^3c^2)(-4a^2b^4c^3)$?

F. $-12a^6b^5c^9$
G. $-12a^6b^4c^{24}$
H. $-60a^6b^5c^9$

J. $-60a^9b^9c^9$

23. Which expression best describes the volume of a rectangular prism that has a width of $3a^3bc^4$ units, a length of $7a^5b^2c^2$ units, and a height of $4ab^3c$?

A. $84a^9b^6c^7$ units^2
B. $14a^{15}b^6c^8$ units^2
C. $84a^8b^5c^6$ units^2
D. $14a^9b^6c^7$ units^2

24. A population of 1500 deer decreases by 1.5% per year. At the end of 10 years, there will be approximately 1290 deer in the population. Which function can be used to determine the number of deer, y, in this population at the end of t years?

F. $y = 1500(1 - 0.015)^t$
G. $y = 1500(0.015)^t$
H. $y = 1500(1 + 0.015)^t$
J. $y = 1500(15)^t$

25. The number of members in a labor union is 240, and the number increases by 5% each year. Find the number of members after 4 years. $y = a(1 + r)^t$

A.   278
B.   292
C.   810
D.   1215