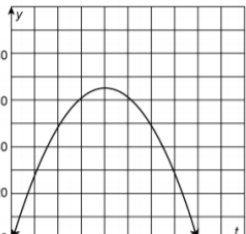
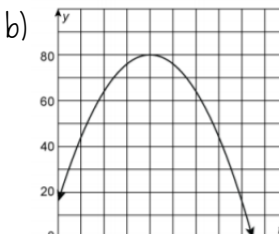
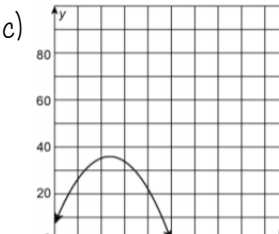
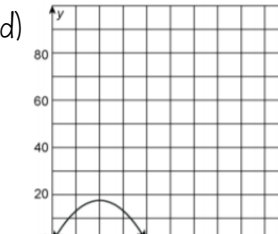


Algebra 2 DISTRICT COMMON ASSESSMENT 1

Directions: Show all work on this paper. When completed, transfer your answers online.

<p>1. What is the equation written in vertex form of a parabola with a vertex of $(-1, 8)$ that passes through $(1, 0)$?</p> <p>a) $y = (x + 1)^2 + 8$ b) $y = 2(x - 1)^2 - 8$ c) $y = 2(x + 1)^2 - 8$ d) $y = -2(x + 1)^2 + 8$</p>	<p>2. Function g is a transformation of the parent function $f(x) = x^2$. The graph of g is a translation left 4 units and down 2 units of the graph of f. Write the equation for g in the form $y = ax^2 + bx + c$.</p> <p>a) $y = x^2 + 8x + 18$ b) $y = x^2 + 8x + 14$ c) $y = x^2 - 8x + 18$ d) $y = x^2 - 8x + 14$</p>										
<p>3. What is the vertex of the graph of the function $f(x) = x^2 + 6x + 9$?</p> <p>a) $(-3, 0)$ b) $(0, -3)$ c) $(0, 3)$ d) $(3, 0)$</p>											
<p>4. Part A: The path of a projectile launched from a 16-ft-tall tower is modeled by the equation $y = -16t^2 + 64t + 16$. Which is the correct graph of the equation?</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>a)</p>  </div> <div style="text-align: center;"> <p>b)</p>  </div> <div style="text-align: center;"> <p>c)</p>  </div> <div style="text-align: center;"> <p>d)</p>  </div> </div>											
<p>4. Part B: The path of a projectile launched from a 16-ft-tall tower is modeled by the equation $y = -16t^2 + 64t + 16$. What is the maximum height, in feet, reached by the projectile?</p> <p>The maximum height is _____ feet.</p>	<p>5. Use quadratic regression to find the equation of a quadratic function that fits the given points.</p> <table border="1" style="margin: 10px auto; border-collapse: collapse;"> <tr> <td style="padding: 5px;">x</td> <td style="padding: 5px;">0</td> <td style="padding: 5px;">1</td> <td style="padding: 5px;">2</td> <td style="padding: 5px;">3</td> </tr> <tr> <td style="padding: 5px;">y</td> <td style="padding: 5px;">6.1</td> <td style="padding: 5px;">71.2</td> <td style="padding: 5px;">125.9</td> <td style="padding: 5px;">89.4</td> </tr> </table> <p>a) $y = 8.52x^2 - 16.72x + 23.47$ b) $y = -18.25x^2 + 94.32x + 4.08$ c) $y = 25x^2 - 10.5x + 2$ d) $y = -25.4x^2 + 106.66x + 2.06$</p>	x	0	1	2	3	y	6.1	71.2	125.9	89.4
x	0	1	2	3							
y	6.1	71.2	125.9	89.4							

<p>6. Solve the equation $x^2 + x = 12$.</p> <p>a) $x = -3$ and $x = -4$ b) $x = 2$ and $x = -6$ c) $x = -2$ and $x = -6$ d) $x = 3$ and $x = -4$</p>	<p>7. A ball is thrown from the top row of seats in a stadium. The function $h(t) = -16t^2 + 64t + 80$ gives the height, h, in feet, of the ball t seconds after it is thrown. How long will it be before the ball hits the ground?</p> <p>The ball will hit the ground after _____ seconds.</p>
<p>8. Identify the interval(s) on which the function $y = x^2 - 2x - 48$ is positive.</p> <p>a) $x < -6$ and $x > 8$ b) $-6 < x < 8$ c) $x > 6$ and $x < -8$ d) $6 < x < 8$</p>	<p>9. Use square roots to solve the equation $x^2 = -25$ over the complex numbers. Select the TWO solutions that apply.</p> <p>a) -5 b) $-5i$ c) $-5i^2$ d) $5i$</p>
<p>10. Write the product $(4 + i)(4 - i)$ in the form $a + bi$.</p> <p>a) $16 - i$ b) $16 - i^2$ c) 17 d) 8</p>	<p>11. Write the quotient $\frac{10}{1+2i}$ in the form $a + bi$.</p> <p>a) $-\frac{10}{3} + \frac{20}{3}i$ b) $10 - 5i$ c) $\frac{5}{2} + \frac{1}{2}i$ d) $2 - 4i$</p>
<p>12. Factor the expression $16x^2 + 25$.</p> <p>a) $(4x - 5i)(4x - 5i)$ b) $(4x - 5i)(4x + 5i)$ c) $(4x - 5)(4x + 5i)$ d) $(4x + 5)(4x - 5)$</p>	<p>13. Solve $0 = x^2 - 10x + 30$ by completing the square.</p> <p>a) $x = 5 + i$ and $x = 5 - i$ b) $x = 5 + i\sqrt{5}$ and $x = 5 - i\sqrt{5}$ c) $x = -5 - i\sqrt{6}$ and $x = -5 + i\sqrt{6}$ d) $x = -5 - i\sqrt{5}$ and $x = -5 + i\sqrt{5}$</p>
<p>14. A function is defined by the equation $y = x^2 + 3x + 1$. Which statements are true? Select all that apply.</p> <p>a) The equation written in vertex form is $y = \left(x + \frac{3}{2}\right)^2 - \frac{5}{4}$ b) The equation written in vertex form is $y = \left(x + \frac{5}{4}\right)^2 - \frac{3}{2}$ c) The graph of the function has a minimum of $y = -\frac{5}{4}$ at $x = -\frac{3}{2}$ d) The domain of the function is all real numbers.</p>	

15. Solve $x^2 + 3x + 4 = 0$ using the Quadratic Formula. **Select any solutions that apply.**

- a) $x = \frac{-3 + i\sqrt{7}}{2}$
- b) $x = \frac{-3 - i\sqrt{7}}{2}$
- c) $x = \frac{-3 + \sqrt{7}}{2}$
- d) $x = \frac{-3 - \sqrt{7}}{2}$

16. Solve $x^2 - 7x + 5 = 0$ using the Quadratic Formula.

- a) $x = \frac{7 + \sqrt{29}}{2}$ and $x = \frac{7 - \sqrt{29}}{2}$
- b) $x = 7 + \sqrt{29}$ and $x = 7 - \sqrt{29}$
- c) $x = -5$ and $x = -1$
- d) $x = \frac{7 + \sqrt{69}}{2}$ and $x = \frac{7 - \sqrt{69}}{2}$

17. **Part A:** A toy cannon ball is launched from a cannon on top of a platform. The equation $h(t) = -5t^2 + 20t + 4$ gives the height, h , in meters, of the ball t seconds after it is launched. What equation can be used to tell whether the ball reaches a height of 12 m?

- a) $-5t^2 + 20t + 4 = 0$
- b) $-5t^2 + 20t + 4 = 12$
- c) $-5t^2 + 20t + 4 + 12 = 0$
- d) $-5t^2 + 20t + 4 = x + 12$

17. **Part B:** A toy cannon ball is launched from a cannon on top of a platform. The equation $h(t) = -5t^2 + 20t + 4$ gives the height, h , in meters, of the ball t seconds after it is launched. Does the ball reach a height of 12m?

- a) Yes
- b) No

18. What value(s) of b will cause $4x^2 + bx + 25 = 0$ to have one real solution? **Select all that apply.**

- a) $b = -20$
- b) $b = -50$
- c) $b = 20$
- d) $b = 100$

19. Determine the number of real solutions of the system:

$$\begin{cases} y = x^2 + 8 \\ y = x + 15 \end{cases}$$

- a) 0
- b) 1
- c) 2
- d) 3

20. Solve the equation $-3x^2 + 2x + 4 = -x - 3$ by writing a linear-quadratic system and solving using the intersection feature of a graphing calculator. Round to the nearest hundredth.

- a) $x \approx -2.44$ and $x \approx 3.12$
- b) $x \approx -1.63$ and $x \approx 4.43$
- c) $x \approx -1.11$ and $x \approx 2.11$
- d) $x \approx -2.61$ and $x \approx 0.42$