

Unit 3b Review

1. Given the function $f(x) = x^2 - 7x + 6$, find $f(3)$.

$$3^2 - 7(3) + 6 = \textcircled{-6}$$

2. What is the value of the function $f(x) = 3x^2 - 4x + 6$ Elevated at $x=4$

$$3(4)^2 - 4(4) + 6 = \textcircled{38}$$

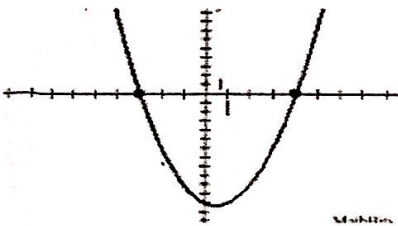
3. The quadratic function $f(x) = -25x^2 + 250x + 1,475$ models the population of a city where x represents the number of years since 2004 and $f(x)$ is the population of the city in thousands of people. What is the estimated population of the city in 2009?

$$2009 - 2004 = 5$$

$$x = 5$$

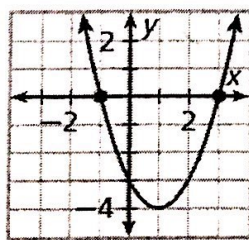
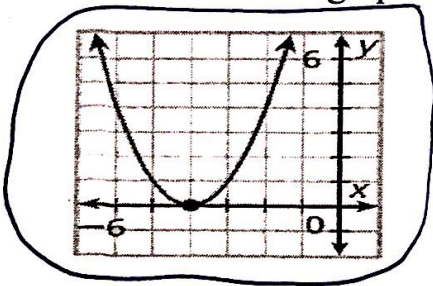
$$-25(5)^2 + 250(5) + 1475 = \textcircled{2100}$$

4. What are the zeros of the function graphed?



$(-3, 0)$ and $(4, 0)$

5. Determine which graph matches the characteristics of $f(x) = x^2 + 8x + 16$

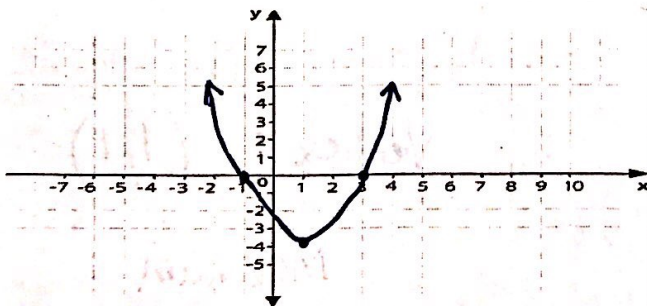


$$= (x + 4)^2$$

$$x + 4 = 0$$

$$\frac{-4 \quad -4}{x = -4}$$

7. Draw a graph that has a solution to $f(x) = x^2 - 2x - 3$? How many solutions does this equation have?

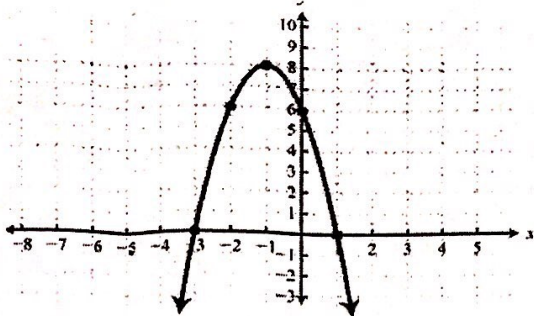


$$a = 1 \quad (x - 1)^2 - 4$$

$$h = 1$$

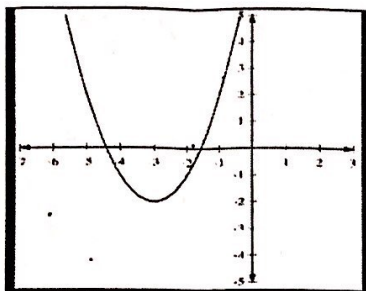
$$k = -4$$

17. What is the Axis of symmetry of the function below?



$$AOS = -1$$

18. List the vertex, AOS, y-intercept, x-intercept, max or min and domain of the parabola below



$$\text{Vertex} = (-3, -2)$$

Domain - All real numbers

$$AOS = -3$$

$$x\text{-intercept} = (-4, 0) \quad (-2, 0)$$

Minimum

20. Write the following quadratic equation $x^2 + 2x + 24$ In vertex form

$$(x + 1)^2 + 23$$

21. Write an equation in vertex form with an axis of symmetry of -3 .

$$(x + 3)^2$$

22. Yvonne is completing the square, is there an error in her work? Why or why not

$$x^2 + 12x + 32 = 0$$

$$x^2 + 12x + \underline{36} = -32 + \underline{36}$$

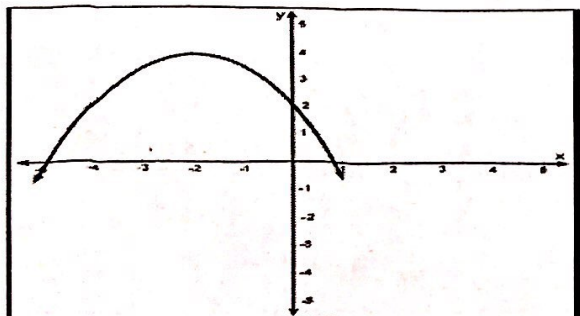
$$(x + \underline{6})^2 = 4$$

$$x + 6 = \pm 2$$

$$x = -4, -8$$

No error. Square root of 4 is + or - 2. Subtract 6 from both sides. $-6 - 2 = -8$ and $-6 + 2 = -4$.

23. Write an equation with a higher maximum value than the one in the graph below.

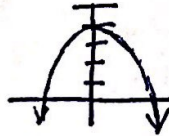


$$-\frac{1}{2}(x + 2) + 5$$

8. Write an equation of $y = f(x)$ moves the graph 8 units to the right and 4 units down?

$$(x-8)^2 - 4$$

9. Sketch the graph of $f(x) = -x + 4$.



10. The parent function, $f(x) = x^2$, is reflected across the x axis stretched by a factor of 2 and shifted left 6 units to create $g(x)$. Write a function in vertex form.

~~$$(2x+6)^2$$~~

$$-2(x+6)^2$$

11. If the function $f(x) = (x+9)^2 - 3$ is shifted up 3 units, what would be the new equation for the function?

$$(x+9)^2$$

12. $y = -3(x+5)^2 - 3$

What is the vertex and axis of symmetry of the quadratic above:

$$\text{Vertex} = (-5, -3) \quad \text{AOS} = -5$$

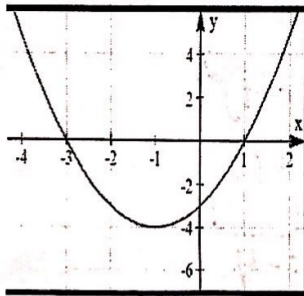
13. Write a function that has its vertex below the x-axis?

$$x^2 - 2$$

14. Describe the vertex of the function $f(x) = x^2 - 5x + 9$.

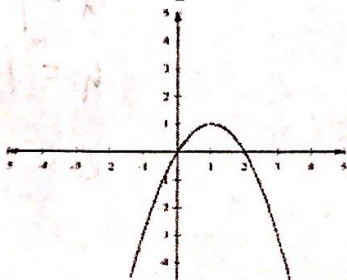
$$\text{Vertex} = (2.5, 2.75)$$

15. What is/are the y-intercept(s) of the quadratic function?



$$(0, -3)$$

16. What is the vertex of the quadratic function and determine if the vertex is a maximum or minimum?



$$\text{Vertex} = (1, 1)$$

Maximum