

$$f(x) = a(x-h)^2 + k$$

2.1-2.2 Review

Question 1

Find the vertex and x-ints. of the function below.

$$h(x) = x^2 - 8x + 16$$

$$x = 4$$

$$v: (4, 0)$$

Question 2

Find the quadratic function in vertex form that has a vertex of (4,-1) and whose graph passes through the point (2,3).

$$3 = a(2-4)^2 - 1$$

$$a = 1$$

$$f(x) = (x-4)^2 - 1$$

Question 3

Determine the right/left hand behavior of the function

$$f(x) = -4x^3 + 10x + 14$$

$$x \rightarrow -\infty, f(x) \rightarrow \infty$$

$$x \rightarrow \infty, f(x) \rightarrow -\infty$$

Question 4

Determine the end behavior, find the zeros and their multiplicities, and graph the following function.

$$f(x) = x^3 - 4x^2 + 4x$$

Question 5

Find a polynomial of degree n that has the following zeros.
zeros: $x = -5, 1, 2$ $n = 4$

Graph your function.

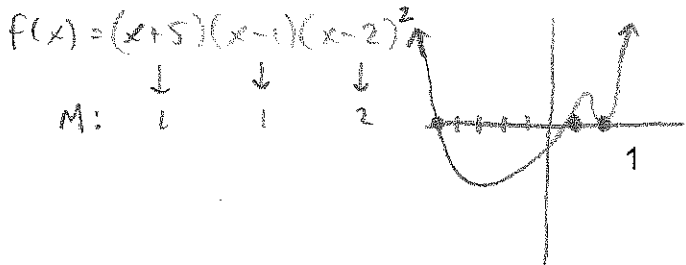
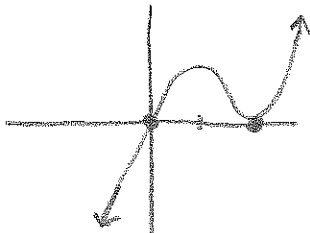
$$x \rightarrow -\infty, f(x) \rightarrow -\infty$$

$$x \rightarrow \infty, f(x) \rightarrow \infty$$

$$0 = x(x-2)^2$$

$$x = 0 \rightarrow 1$$

$$x = 2 \rightarrow 2$$



Question 6

Find the vertex by completing the square, then find the x-ints.

$$f(x) = x^2 + 10x + 14$$

$$0 = (x^2 + 10x + 25) - 11$$

$$0 = (x + 5)^2 - 11$$

$$x = -5 \pm \sqrt{11} \quad v: (-5, -11)$$

Question 7

Determine the right/left hand behavior of the function.

$$f(x) = 5x^2 + 10x + 14$$

$$x \rightarrow -\infty, f(x) \rightarrow \infty$$

$$x \rightarrow \infty, f(x) \rightarrow \infty$$

Question 8

Find two quadratic functions, one upward and one downward, each in standard form that have the following x-intercepts: (-6,0) and (9,0)

$$d: f(x) = -(x+6)(x-9)$$

$$u: f(x) = (x+6)(x-9)$$

Question 9

A manufacturer of lighting fixtures has daily production costs of

$$C = 800 - 10x + 25x^2$$

where C is the total cost (in dollars) and x is the number of fixtures produced. How many fixtures should be produced each day to yield a minimum cost?

$$h = \frac{10}{2\left(\frac{1}{4}\right)} = \frac{10}{\frac{1}{2}} = 20 \text{ fixtures}$$