

$$4. f(x) = x^2 + 2x - 8$$

$$f(x) = x^2 + 2x + \left(\frac{2}{2}\right)^2 - 8 - \left(\frac{2}{2}\right)^2$$

$$= x^2 + 2x + 1 - 8 - 1$$

$$= (x+1)^2 - 9$$

$$\text{standard form} = (x+1)^2 - 9$$

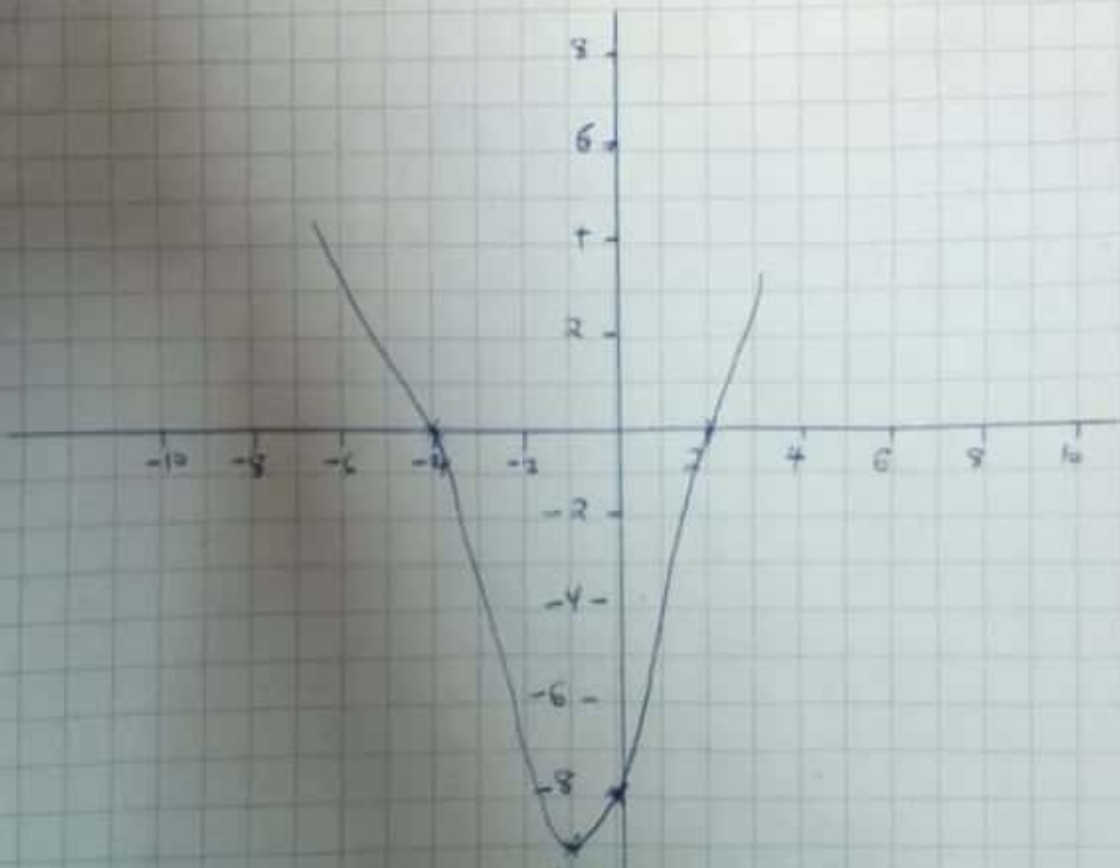
$$\text{Vertex} = (h, k) = (-1, -9)$$

$$\begin{aligned} \text{x-intercept} \Rightarrow x^2 + 2x - 8 &= 0 \\ (x+4)(x-2) &= 0 \\ x &= -4, x = 2 \end{aligned}$$

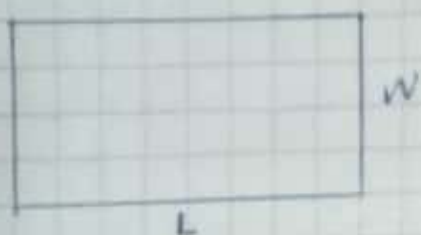
$$= (-4, 0), (2, 0)$$

$$\begin{aligned} \text{y-intercept} \Rightarrow y &= 0^2 + 2(0) - 8 \\ y &= -8 \end{aligned}$$

$$= (0, -8)$$



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Perimeter: $2L + 2W = 1200$

Area: $A = LW$ subject to $2L + 2W = 1200$

$$2L + 2W = 1200$$

$$L + W = 600$$

$$L = 600 - W$$

$$A = (600 - W)W$$

$$= 600W - W^2$$

$$= -W^2 + 600W$$

$$= -(W^2 - 600W + 90000) + 90000$$

$$= -(W - 300)^2 + 90000$$

Maximum area = 90000 ft^2

9.

Zeros

Multiplicity

-0.5

3

The graph passes through $x = -0.5$
but flattens out a bit first

2

2

Graph touches x-axis at $x = 2$ and
bounces back.

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$$f(x) = (x-3)^2(x-1)(x+2)$$

$$12 = 0(0-3)^2(0-1)(0+2)$$

$$12 = 0(-3)^2(-1)(2)$$

$$12 = -18a$$

$$a = \frac{-12}{18} = -\frac{2}{3}$$

$$f(x) = -\frac{2}{3}(x-3)^2(x-1)(x+2)$$

$$28. \quad D \propto T^2$$

$$D = KT^2$$

$$64 = K(2)^2$$

$$K = \frac{64}{4} = 16$$

$$D = 16T^2$$

$$256 = 16T^2$$

$$T^2 = \frac{256}{16} = 16$$

$$T = \sqrt{16} = 4 \text{ seconds}$$