

COURSE REVIEW

Thu 6 June 2019

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

$$f(5) = 2(5)^2 + 3(5) - 1$$

$$\begin{aligned} &= 50 + 15 - 1 = 64 \\ f(4) &= 2 \cdot 4^2 + 3 \cdot 4 - 1 = 43 \end{aligned} \quad \left. \vphantom{\begin{aligned} &= 50 + 15 - 1 = 64 \\ f(4) &= 2 \cdot 4^2 + 3 \cdot 4 - 1 = 43 \end{aligned}} \right\} \begin{aligned} f(5) - f(4) &= \\ &= 64 - 43 = 21 \end{aligned}$$

When does it hit the water?

↳ asking for t such that $\boxed{h(t) = 0}$

$$h(t) = 19.6 - 4.9t^2$$

$$\boxed{-4.9t^2 + 19.6 = 0}$$

$$ax^2 + bx + c = 0$$
$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$a = -4.9$$

$$b = 0$$

$$c = 19.6$$

$$t = \frac{0 \pm \sqrt{0 - 4(-4.9)19.6}}{2 \cdot (-4.9)}$$

$$t = \frac{\pm \sqrt{384.16}}{-9.8} \rightarrow t = \frac{\sqrt{384.16}}{9.8}$$

$$h(t) = 10$$

$$-4.9t^2 + 19.6 = 10$$

$$-4.9t^2 + 19.6 - 10 = 0$$

$$-4.9t^2 + 9.6 = 0$$

$$a = -4.9$$

$$b = 0$$

$$c = 9.6$$

$$t = \frac{0 \pm \sqrt{0 - 4(-4.9) \cdot 9.6}}{2(-4.9)}$$

$$ax^2 + bx + c = 0$$
$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$= \frac{\pm \sqrt{188.16}}{-9.8}$$

$\approx 1.40 \text{ m}$

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