

3M Quad Quiz 2

Name: _____

The path of a ball thrown upwards from the roof of WCSS can be modelled by the relation $h = -2(t+1)(t-4)$ where h is the height in m above the ground, t seconds after the ball is thrown.

- a. What was the initial height of the ball?
- b. What was the maximum height of the ball?
- c. When does the ball fall to the ground?
- d. Find the time the ball was at its maximum height.
- e. State the Domain and Range as it applies to the situation.
- f. For how long is the ball at or above 10m?

8m ✓✓
 12.5m ✓✓
 4sec ✓
 1.5sec ✓✓
 $D = \{t \in \mathbb{R} \mid 0 \leq t \leq 4\}$ ✓
 $R = \{h(t) \in \mathbb{R} \mid 0 \leq h(t) \leq 12.5\}$ ✓
 approx 2.24 sec ✓✓✓✓

a) $h = -2(0+1)(0-4)$
 $= 8$

c) $t = -1$ or $t = 4$

d/b) $t = \frac{-1+4}{2}$
 $= \frac{3}{2}$
 $= 1.5$

$h = -2(1.5+1)(1.5-4)$
 $= 12.5$

f) $10 = -2(t+1)(t-4)$
 $10 = -2(t^2 - 3t - 4)$
 $10 = -2t^2 + 6t + 8$
 $2t^2 - 6t + 2 = 0$

Solve
 $t = \frac{6 \pm \sqrt{(-6)^2 - 4(2)(2)}}{2(2)}$
 $= \frac{6 \pm \sqrt{20}}{4}$
 $t = \frac{6 + \sqrt{20}}{4}$ or $t = \frac{6 - \sqrt{20}}{4}$
 $= 2.62$ $= 0.38$

How long? $= 2.62 - 0.38$
 $= 2.24$