

12. $H = m$ $t = \text{seconds}$ $h(t) = -4.9t^2 + 19.6t + 2$

How long the football will be in the air?

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

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

* Divide by -4.9 both sides

$$0 = t^2 - 4t + \frac{2}{-4.9}$$

$$0 = t^2 - 4t - 0.408$$

Let's use quadratic formula: $\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$$= \frac{4 \pm \sqrt{16 - (4 \cdot 1 \cdot (-0.408))}}{2}$$

$$= \frac{4 \pm \sqrt{17.632}}{2}$$

$$= 4.1 \text{ or } -0.1$$

∴ The football will be in the air for 4.1 seconds.

