Mathematics 11UC

3.3 – Solving Quadratic Equations

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$f(x) = x^2 - 8x + 12$

$+3 \qquad +3$

$-3 = x^2 - 8x + 12$

$0 = x^2 - 8x + 15$

$(x)\ 15 \qquad -3, -5$

$(+)\ -8$

$0 = (x-3)(x-5)$

$=0 \qquad =0$

$x - 3 = 0$

$x = 3$

$x - 5 = 0$

$x = 5$

What is the value of x when $f(x) = -3$?

$(5)^2 - 8(5) + 12$

$= 25 - 40 + 12$

$= -3$

The population of an Ontario city is modelled by the function $P(t) = 0.5t^2 + 10t + 300$, where $P(t)$ is the population in thousands and t is the time in years. *Note*: $t = 0$ corresponds to the year 2000.

a) What was the population in 2000? → $t = 0$

b) What will the population be in 2010? → $t = 2010 - 2000 = 10$

c) When is the population expected to be 1 050 000? 1050

a) $P(0) = 0.5(0)^2 + 10(0) + 300$

$= 300,000$

b) $P(10) = 450,000$

c) in the year 2030, the pop will be 1,050,000.

The function $h(t) = 2 + 50t - 1.862t^2$, where $h(t)$ is the height in metres and t is time in seconds, models the height of a golf ball above the planet Mercury's surface during its flight.

a) What is the maximum height reached by the ball? → 337.66 m

b) How long will the ball be above the surface of Mercury? → 26.89 seconds

c) When will it reach a height of 200 m on the way down? → 22 seconds

a) Find zeros, average them, then use that value as your X.

Zeros are: -0.0399 and 26.8928

$$h = \frac{-0.0399 + 26.8928}{2} \doteq 13.43$$