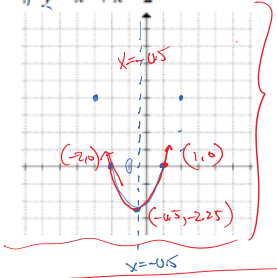
3.x

November 25, 2015 12:24 PM

i) $y = x^2 + x - 2$



a) x-intercepts:

$x^2 + x - 2 = 0$

$(x+2)(x-1) = 0$

$x = -2 \quad x = 1$

b) Axis of symmetry

$\frac{-2+1}{2} = -\frac{1}{2}$

$x = -0.5$

1 mk

$y = (x+2)(x-1)$ $y = (-3+2)(-3-1)$

$y = (2+2)(2-1)$ $= (-1)(-4)$

$y = 4$ $= 4$

c) vertex:

$y = x^2 + x - 2$

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

$= (+1.5)(-1.5)$

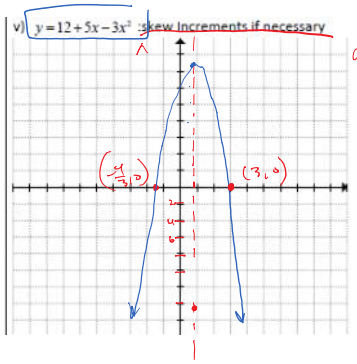
$= -2.25$

$(-0.5, -2.25)$

D: $x \in \mathbb{R}$

R: $y \geq -2.25$

v) $y = 12 + 5x - 3x^2$ skew increments if necessary



D: $x \in \mathbb{R}$

R: $y \leq 14.0833$

$y =$

$y = 12 + 5x - 3x^2$

a) $y = -(3x^2 - 5x - 12)$

$3 \quad -3 = -9$

$1 \quad -4 = -4$

$y = -(3x+4)(x-3)$

$(3x+4)(x-3) = 0$

$x = -\frac{4}{3} \quad x = 3$

b) A.O.S. $\frac{1}{2}\left(-\frac{4}{3} + 3\right)$

$= \frac{1}{2}\left(-\frac{4}{3} + \frac{9}{3}\right)$

$= \frac{1}{2}\left(\frac{5}{3}\right) = \frac{5}{6}$

$x = \frac{5}{6}$

c) vertex:

$y = -(3x+4)(x-3)$

$y = -\left(3\left(\frac{5}{6}\right)+4\right)\left(\frac{5}{6} - 3\right)$

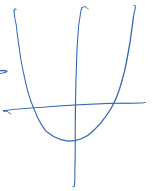
$= -\left(\frac{5}{2} + \frac{8}{2}\right)\left(\frac{5}{6} - \frac{18}{6}\right)$

$-\left(\frac{13}{2}\right)\left(\frac{-13}{6}\right) = \frac{+169}{12}$

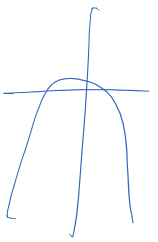
$= +14.083$

$\left(\frac{5}{6}, +14.083\right)$

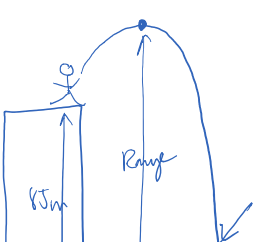
$y = 3x^2 - 5x - 12$



$y = -3x^2 + 5x + 12$



5. Tom throws a football from the top of his building. The height of the ball is given by the formula: $h(t) = -12t^2 + 7t + 85$, where "h" is the height of the football and "t" is the number of seconds after the throw. What is the domain and range of this scenario? When will the ball be falling to 36m?

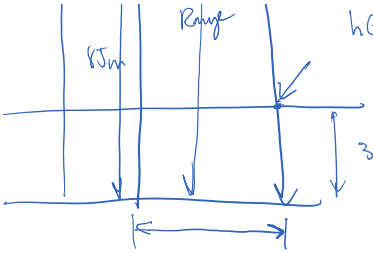


$h(t) = -12t^2 + 7t + 85$

$h(0) = 85$

$h(t) = -12t^2 + 7t + 85 = 36$

$-12t^2 + 7t + 49 = 0$



$h(t) = -12t^2 + 7t + 85 = 36$

$-12t^2 + 7t + 49 = 0$

$-(12t^2 - 7t - 49) = 0$

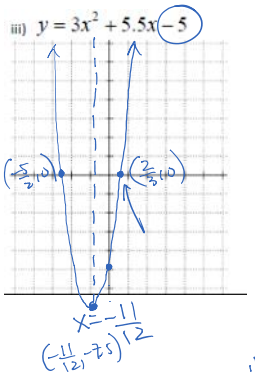
$4 \times 7 = 21$

$3 \times -7 = -21$

$-(4t + 7)(3t - 7) = 0$

$t = -\frac{7}{4}$ $\quad t = \frac{7}{3}s$

iii) $y = 3x^2 + 5.5x - 5$



D: $x \in \mathbb{R}$

R: $y \geq -7.5$.

$y = \frac{(3x^2 + 5.5x - 5) \times 2}{2}$

$y = \frac{1}{2}(6x^2 + 11x - 10)$

$3 \quad 5 = 15$

$2 \quad -2 = -4$

$0 = \frac{1}{2}(3x - 2)(2x + 5)$

$3x - 2 = 0$ $\quad 2x + 5 = 0$

$x = \frac{2}{3}$ $\quad x = -\frac{5}{2}$

b) A.O.S.

$\frac{1}{2}\left[\frac{2}{3} + \left(-\frac{5}{2}\right)\right]$

$\frac{1}{2}\left[\frac{4}{6} - \frac{15}{6}\right] = \frac{-11}{12}$

$x = -\frac{11}{12}$

c) $y = 3x^2 + 5.5x - 5$

$y = \frac{1}{2}(3x - 2)(2x + 5)$

$y = \frac{1}{2}\left[3 \cdot \left(\frac{-11}{12}\right) - 2\right]\left[2\left(\frac{-11}{12}\right) + 5\right]$

$y = \frac{1}{2}\left[\frac{-11}{4} - 2\right]\left[\frac{-11}{6} + 5\right]$

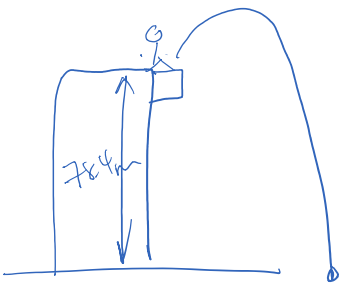
$y = \frac{1}{2}\left[\frac{-11}{4} - \frac{8}{4}\right]\left[\frac{-11}{6} + \frac{30}{6}\right]$

$= \frac{1}{2}\left[\frac{-19}{4}\right]\left[\frac{19}{6}\right]$

$= -7.5208$

$\left(-\frac{11}{12}, -7.52\right)$

A tennis ball is dropped from a balcony. The height of the ball (h) above the ground is given by the formula $h(t) = 78.4 - 4.9t^2$. Where "t" is the number of seconds after release. How high is the balcony from the ground? When will the ball hit the ground?



a) $h(t) = 78.4 - 4.9t^2$

$h(0) = 78.4 - 4.9(0^2)$

$h(0) = 78.4\text{m}$

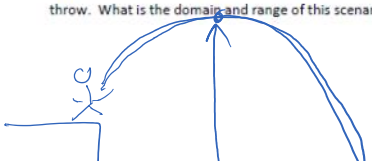
b) $0 = 78.4 - 4.9t^2$

$4.9t^2 = 78.4$

$t^2 = 16.$

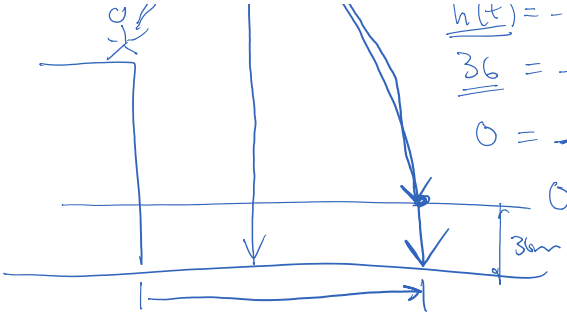
$t = 4$.

5. Tom throws a football from the top of his building. The height of the ball is given by the formula: $h(t) = -12t^2 + 7t + 85$, where "h" is the height of the football and "t" is the number of seconds after the throw. What is the domain and range of this scenario? When will the ball be falling to 36m?



$h(t) = -12t^2 + 7t + 85$

$36 = -12t^2 + 7t + 85$



$h(t) = -12t^2 + 7t + 85$

$36 = -12t^2 + 7t + 85$

$0 = -12t^2 + 7t + 49$

$0 = -(12t^2 - 7t - 49)$

$3 \cdot -7 = 21$

$4 \cdot -7 = -28$

$0 = -(3t - 7)(4t + 7)$

$t = \frac{7}{3}$ $\quad t = -\frac{7}{4}$