Find the vertex of each parabola.

a) $y = x^2 - 8x + 4$

$x\text{-value} = \frac{-b}{2a}$

$x\text{-value} = \frac{8}{2}$

$x = 4$

$y = 4^2 - 8(4) + 4$

$= 16 - 32 + 4$

$= -12$

Vertex $= (4, -12)$

b) $y = -2x^2 - 4x + 5$

$y = -2(x^2 + 2x + 1 - 1) + 5$

$y = -2[(x+1)^2 - 1] + 5$

$y = -2(x+1)^2 + 2 + 5$

$y = -2(x+1)^2 + 7$

Vertex $= (-1, 7)$

$$y = 4x^2 - 32x + 15$$

$\left(\frac{-8}{2}\right)^2$

$$= 4(x^2 - 8x + 16 - 16) + 15$$

$$= 4[(x-4)^2 - 16] + 15$$

$$= 4(x-4)^2 - 64 + 15$$

$$= 4(x-4)^2 - 49$$

Brody is jumping on a trampoline in his backyard. Each jump takes 2 seconds from beginning to end. He passes his bedroom window, which is 4 m high, 0.4 seconds into his jump.

a) Determine an equation to model Brody's height vs. time

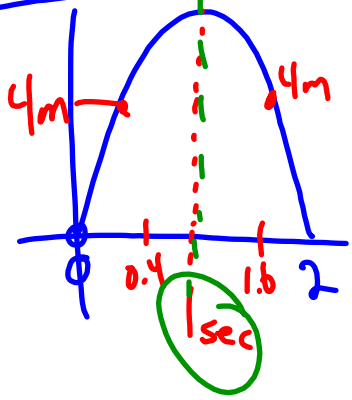
$y = a(x-0)(x-2)$

$4 = a(0.4)(0.4-2)$

$4 = a(-0.64)$

$\frac{4}{-0.64} \quad \frac{a(-0.64)}{-0.64}$

$a = -6.25$



b) What is Brody's maximum height?

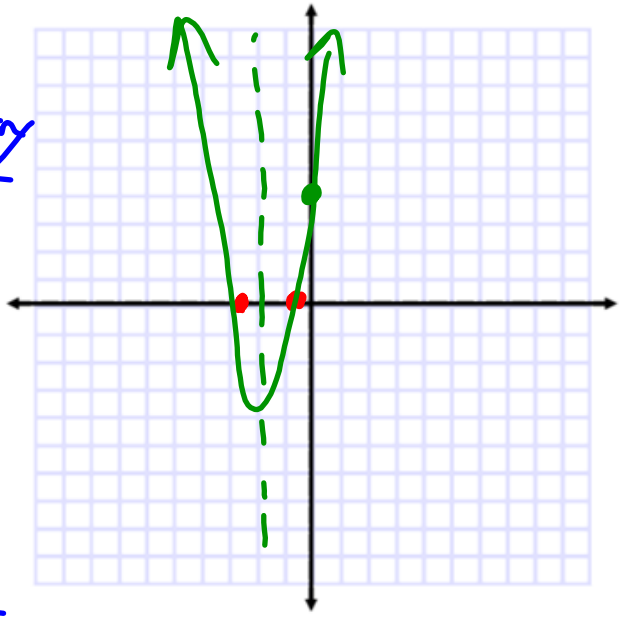
$y = -6.25(x)(x-2)$

$y = -6.25(1)(1-2)$

$= 6.25\text{m}$

Sketch the graph of $y = 2x^2 + 7x + 4$.

y-int: 4



Axis of Symmetry

$\frac{-b}{2a} = \frac{-7}{4} = -1.75$

$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

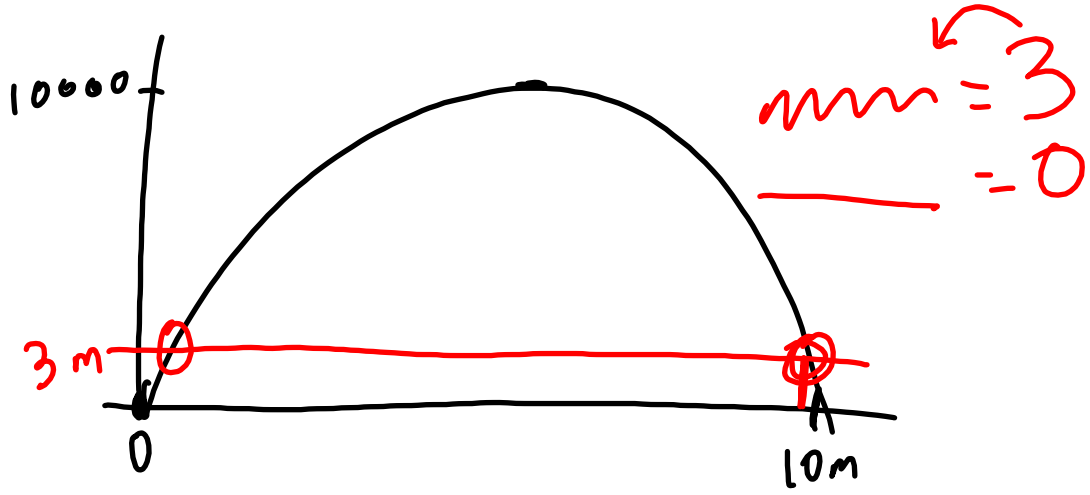
$= \frac{-7 \pm \sqrt{7^2 - 4(2)(4)}}{2(2)}$

$= \frac{-7 \pm \sqrt{49 - 32}}{4}$

$= \frac{-7 \pm \sqrt{17}}{4}$

$x = \frac{-7 + \sqrt{17}}{4} \overset{4.1}{=} -0.725$

$x = \frac{-7 - \sqrt{17}}{4} \overset{4.1}{=} -2.77$


10000
3 m
0
10m
= 3
= 0

For the equation $y = 2x^2 + 3x + k$, what value of k will result in:

a) 2 real x-intercepts

$b^2 - 4ac > 0$

$3^2 - 4(2)k > 0$

$9 - 8k > 0$

$9 > 8k$

$\frac{9}{8} > k$

$1.125 > k$

b) 1 real x-intercept

$k = 1.125$

c) 0 real x-intercepts

$k < 1.125$

x-intercepts

2 roots	1 root	0 roots
$b^2-4ac>0$	$b^2-4ac=0$	$b^2-4ac<0$

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Review on Monday

TEST TUESDAY