Bell work

Find the x-intercepts:

factor
quadratic formula
CTS
taking the square root of both sides

1. $y = x^2 + 6x + 15$

$0 = x^2 + 6x + 15$

$1 \cdot 15$
$3 \cdot 5$

$\underline{9} - 15 = x^2 + 6x + \underline{9}$

$-6 = (x+3)^2$

$\pm\sqrt{-6} = x + 3$

$x = -3 \pm i\sqrt{6}$ No x-intercepts

2. $y = -3x^2 - 6x - 10$

$y = -(3x^2 + 6x + 10)$

$0 = -(3x^2 + 6x + 10)$
a, b, c

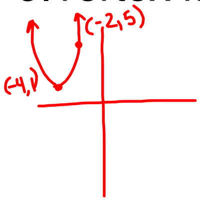
$x = \frac{-6 \pm \sqrt{36 - 4(3)(10)}}{2(3)}$

$x = \frac{-6 \pm \sqrt{-84}}{6} = \frac{-6 \pm i\sqrt{84}}{6}$

No x-intercepts

Write the equation for the parabola with the given information.

3. vertex is (-4, 1) and passes through (-2, 5)
x y



$y = a(x+4)^2 + 1$

$5 = a(-2+4)^2 + 1$

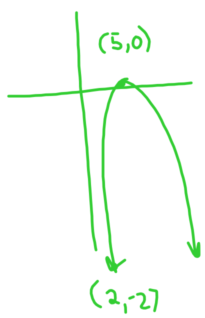
$4 = a(2)^2$

$4 = 4a$

$a = 1$

$y = (x+4)^2 + 1$

4. vertex is (5, 0) and passes through (2, -27)
x y



$y = a(x-5)^2 + 0$

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

$-27 = a(2-5)^2$

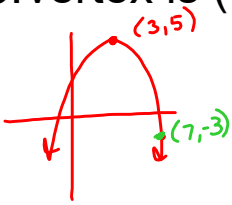
$\frac{-27}{9} = \frac{9a}{9}$

$a = -3$

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

5. vertex is (3, 5) and passes through (7, -3)

$x \quad y$



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

$-3 = a(7-3)^2 + 5$

$-8 = a(4)^2$

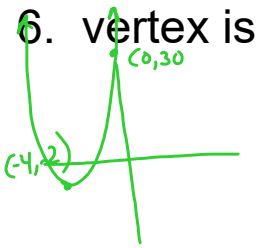
$\frac{-8}{16} = \frac{16a}{16}$

$a = -1/2$

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

6. vertex is (-4, -2) and passes through (0, 30)

$x \quad y$



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

$30 = a(0+4)^2 - 2$

$32 = a(4)^2$

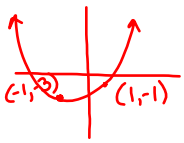
$32 = 16a$

$a = 2$

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

7. vertex is (-1, -3) and passes through (1, -1)

$x \quad y$



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

$-1 = a(1+1)^2 - 3$

$2 = a(2)^2$

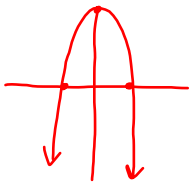
$2 = 4a$

$a = \frac{1}{2}$

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

8. (-2, 0), (3, 0), (0, 12)

$x \quad y$



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

$12 = a(2)(-3)$

$12 = -6a$

$a = \frac{12}{-6} = -2$

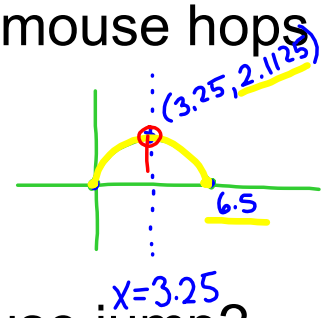
$y = -2(x+2)(x-3)$

9. A woodland jumping mouse hops along a parabolic function

$y = -.2(x - 0)(x - 6.5)$

$y = -.2x(x - 6.5)$

$y = -.2(3.25)(3.25 - 6.5)$



V: (3.25, 2.1125)

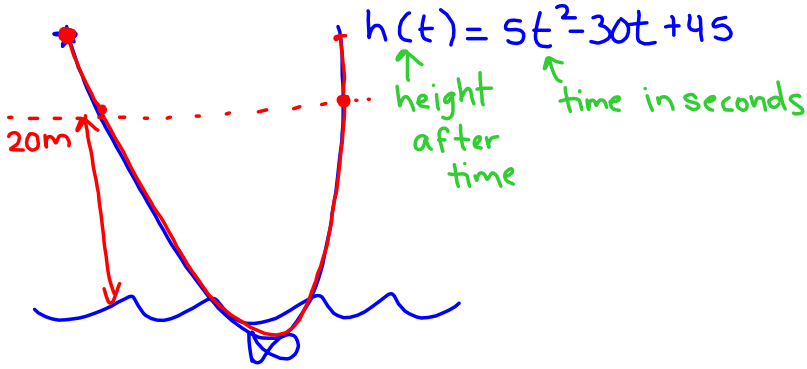
a) How far does the mouse jump?

6.5 ft

b) Could the mouse jump over a 2 foot fence? Explain yes 2.1125 ft

https://www.youtube.com/watch?v=irEcGfCoAHA

10. An osprey, a fish eating bird of prey, dives towards the water to a salmon. The height, h, in meters, of the osprey above water, t seconds after it begins to dive can be approximated by the function: $h(t) = 5t^2 - 30t + 45$. Determine the time it takes the osprey to reach a height of 20 meters.



$20 = 5t^2 - 30t + 45$

$0 = 5t^2 - 30t + 25$

$0 = 5(t^2 - 6t + 5)$

$0 = 5(t-5)(t-1)$

$t = 5$ sec

$t = 1$ sec

https://www.youtube.com/watch?v=rhSbp2fE7-Q