Name_____Date:_____

Application of Quadratics: Making it rain

$a = -16 \quad h = \frac{3}{2} \quad k = 100$

Daija is standing on the roof of the school holding a sack of O-Bucks. She decides to make it rain, and throw the sack from the roof of the school. The trajectory of the sack of O-bucks can be modeled by the equation $f(t) = -16t^2 + 48t + 64$.

a) How high is the roof?

64 feet

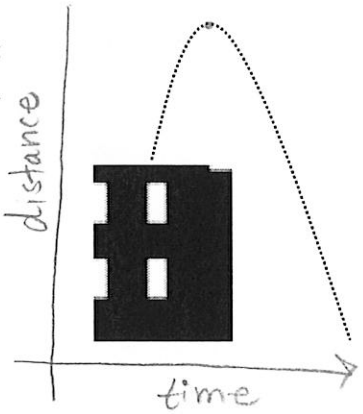
b) What is the highest that the sack of O-Bucks will reach? And how many seconds will it take to get to that point?

$(h, k) \quad (\frac{3}{2}, 100)$

t , feet

100 feet

1.5 seconds



c) How many seconds will it take to hit the ground in front of Robin's feet?

$0 = -16t^2 + 48 + 64$

$= -16(t^2 - 3x - 4)$

$= -16(t+1)(t-4)$

zeros $t = -1$ and $t = +4$

negative seconds? ☹

↳ it will take 4 seconds to reach Robin's feet.

zeros $x = -1$ and $x = 4$

Distribute, multiply and add to find the answer. Converting from VERTEX to STANDARD form

$(x-3)^2 =$	$(x-3)^2+4 =$
$(x-3)(x-3)$ $x^2-3x-3x+9$ x^2-6x+9	$x^2-6x+9+4$ $x^2-6x+13$
$-(x-3)^2+4 =$	Bonus $2(x-3)^2+4 =$
$-(x^2-6x+9)+4$ $-x^2+6x-9+4$ $-x^2+6x-5$	$2(x^2-6x+9)+4$ $2x^2-12x+18+4$ $2x^2-12x+22$ Hint: $2[(x-3)(x-3)]+4$

Distribute, multiply and add to find the answer. Converting from VERTEX to STANDARD form

$(x-3)^2 =$	$(x-3)^2+4 =$