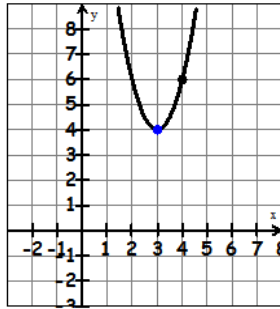


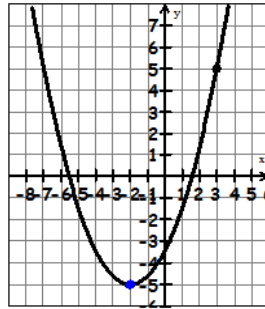
Answers

a.



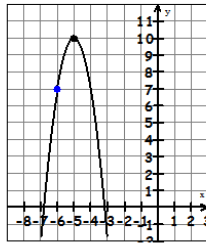
a) vertex (3, 4)  
 pt (4, 6)  
 $y = a(x-3)^2 + 4$   
 $6 = a(4-3)^2 + 4$   
 $6 = a(1)^2 + 4$   
 $2 = a$   
 $y = 2(x-3)^2 + 4$

b.



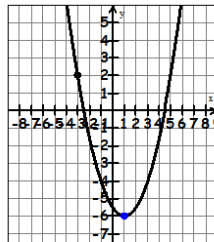
b) vertex (-2, -5)  
 pt (3, 5)  
 $y = a(x+2)^2 - 5$   
 $5 = a(3+2)^2 - 5$   
 $5 = a(5)^2 - 5$   
 $10 = 25a$   
 $\frac{10}{25} = a$   
 $a = \frac{2}{5}$   
 $y = \frac{2}{5}(x+2)^2 - 5$   
 or  
 $y = 0.4(x+2)^2 - 5$

c.



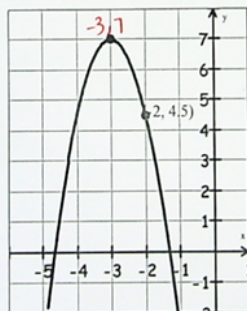
c) vertex (-5, 10)  
 pt (-6, 7)  
 $y = a(x+5)^2 + 10$   
 $7 = a(-6+5)^2 + 10$   
 $7 = a(-1)^2 + 10$   
 $-3 = a$   
 $y = -3(x+5)^2 + 10$

d.

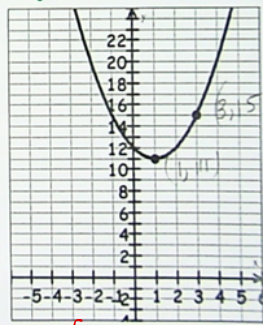


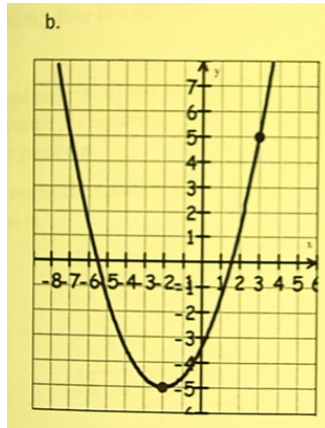
(d) vertex (1, -6)  
 pt (-3, 2)  
 $y = a(x-1)^2 - 6$   
 $2 = a(-3-1)^2 - 6$   
 $2 = a(-4)^2 - 6$   
 $8 = 16a$   
 $\frac{8}{16} = a$   
 $y = \frac{1}{2}(x-1)^2 - 6$

e.  $y = -2.5(x+3)^2 + 7$



f.  $y = (x-1)^2 + 11$





vertex  $(-2, -5)$   $(h, k)$   
 point  $(3, 5)$

1) vertex  
 2) point  
 3) solve a  
 4) write eq'n

$$y = a(x-h)^2 + k$$

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

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

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

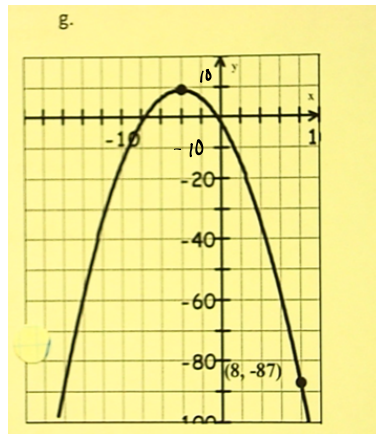
$$5 + 5 = 25a$$

$$10 = 25a$$

$$\frac{10}{25} = a$$

$$0.4 = a$$

$y = 0.4(x+2)^2 - 5$



vertex  $(-4, 10)$   
 point  $(8, -87)$

$$y = a(x+4)^2 + 10$$

$$-87 = a(8+4)^2 + 10$$

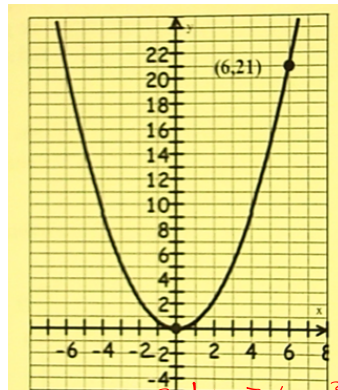
$$-87 = a(12)^2 + 10$$

$$-87 - 10 = 144a$$

$$\frac{-97}{144} = \frac{144a}{144}$$

$$\frac{-97}{144} = a$$

$y = \frac{-97}{144}(x+4)^2 + 10$



(a) vertex  $(0, 0)$   
 point  $(6, 21)$

$$y = a(x-h)^2 + k$$

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

$$21 = a(6-0)^2 + 0$$

$$21 = a(6)^2$$

$$21 = 36a$$

$$\frac{21}{36} = a$$

$y = \frac{21}{36}(x-0)^2 + 0$

$y = \frac{21}{36}x^2$

$y = \frac{7}{12}x^2$  |  $y = \frac{7}{12}(x-0)^2 + 0$   
 $y = \frac{7}{12}x^2$

$y = -\frac{4}{5}(x+5)^2$

vertex  $(-5, 0)$   
 pt  $(0, -20)$

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

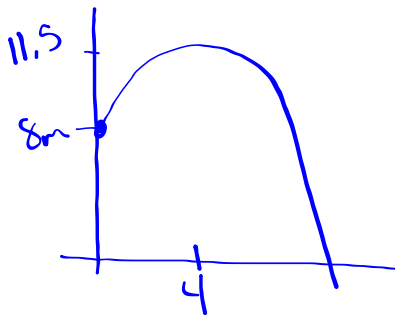
$$-20 = a(0+5)^2$$

$$-20 = a(5)^2$$

$$\frac{-20}{25} = \frac{25a}{25}$$

$a = -\frac{20}{25}$   
 $a = -\frac{4}{5}$   
 OR  $a = -0.8$

A football is kicked off a building that is 8m high. The ball reaches a max height of 11.5m in 4 seconds. Draw a sketch. Write an equation to represent the height of the football above the ground in  $t$  seconds.



$$y = -\frac{35}{16}(x-4)^2 + 11.5$$

$$y = -0.21875(x-4)^2 + 11.5$$

$$y = -\frac{7}{32}(x-4)^2 + 11.5$$

vertex  $(4, 11.5)$  ①  
point  $(0, 8)$  ②

$$y = a(x-h)^2 + k$$

$$y = a(x-4)^2 + 11.5$$

$$8 = a(0-4)^2 + 11.5$$

$$8 = a(-4)^2 + 11.5$$

$$8 = 16a + 11.5$$

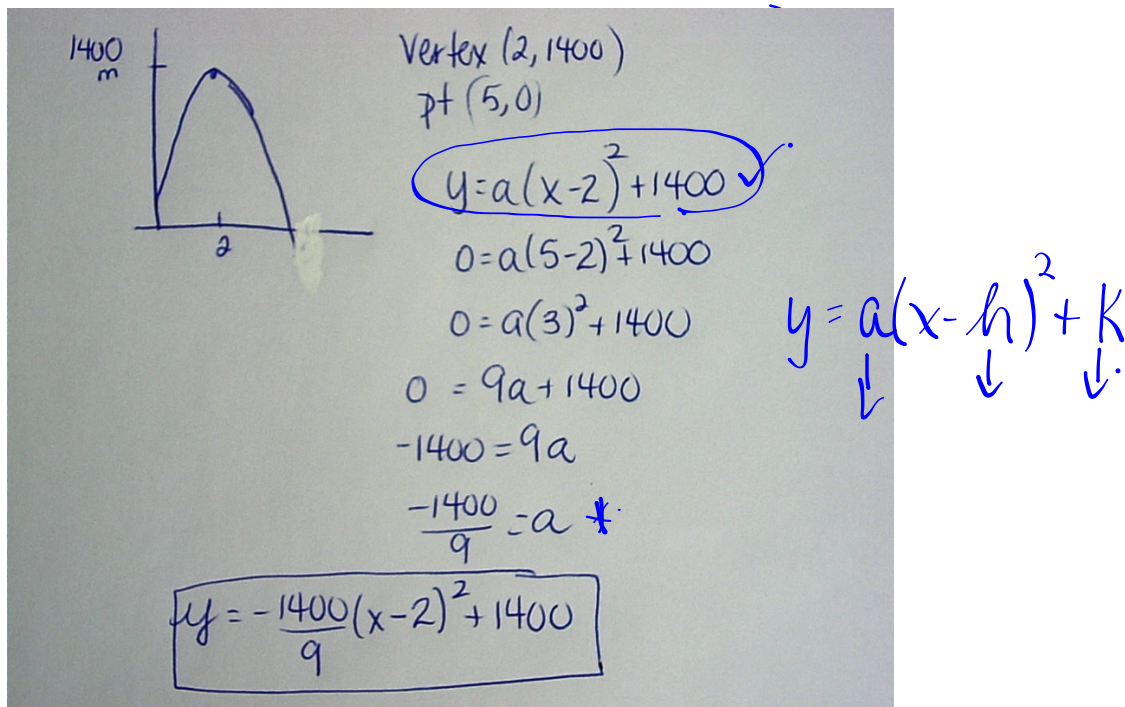
$$8 - 11.5 = 16a$$

$$-3.5 = 16a$$

$$\frac{-3.5}{16} = a$$

### Example 3:

Mexican revolutionaries are shooting guns in the air in celebration. The bullets reach a maximum height of 1400 meters after 2 seconds and hit the ground at 5s. Write an equation to represent the height of the bullets with respect to time. Draw a sketch



X	Y
6	61
5	33
4	13
3	1
2	-3
1	1
0	13

$(-6, 61)$   
 $(-5, 33)$   
 $(-4, 13)$   
 $(-3, 1)$   
 $(-2, -3)$   
 $(-1, 1)$

vertex  $(-2, -3)$   
 point ( , )

vertex

$X=0$

vertex  $(-2, -3)$

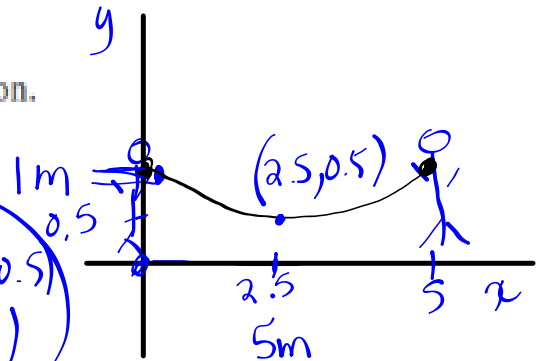
<p>pt <math>(-6, 61)</math></p> $y = a(x+2)^2 - 3$ $61 = a(-6+2)^2 - 3$ $61 = a(-4)^2 - 3$ $61 = 16a - 3$ $61 + 3 = 16a$ $64 = 16a$ $4 = a$	<p>pt <math>(-5, 33)</math></p> $y = a(x+2)^2 - 3$ $33 = a(-5+2)^2 - 3$ $33 = a(-3)^2 - 3$ $33 = 9a - 3$ $33 + 3 = 9a$ $36 = 9a$ $4 = a$	<p>pt <math>(-4, 13)</math></p> $y = a(x+2)^2 - 3$ $13 = a(-4+2)^2 - 3$ $13 = a(-2)^2 - 3$ $13 = 4a - 3$ $13 + 3 = 4a$ $16 = 4a$ $4 = a$
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15. Serge and a friend are throwing a paper airplane to each other. They stand 5 m apart from each other and catch the airplane at a height of 1 m above the ground. Serge throws the airplane on a parabolic flight path that achieves a minimum height of 0.5 m halfway to his friend.
- Determine a quadratic function that models the flight path for the height of the airplane.
  - Determine the height of the plane when it is a horizontal distance of 1 m from Serge's friend.
  - State the domain and range of the function.

$$y = a(x-h)^2 + k$$

vertex (2.5, 0.5)  
pt (0, 1)



$$y = a(x-2.5)^2 + 0.5$$

$$1 = a(0-2.5)^2 + 0.5$$

$$1 = a(-2.5)^2 + 0.5$$

$$1 - 0.5 = 6.25a$$

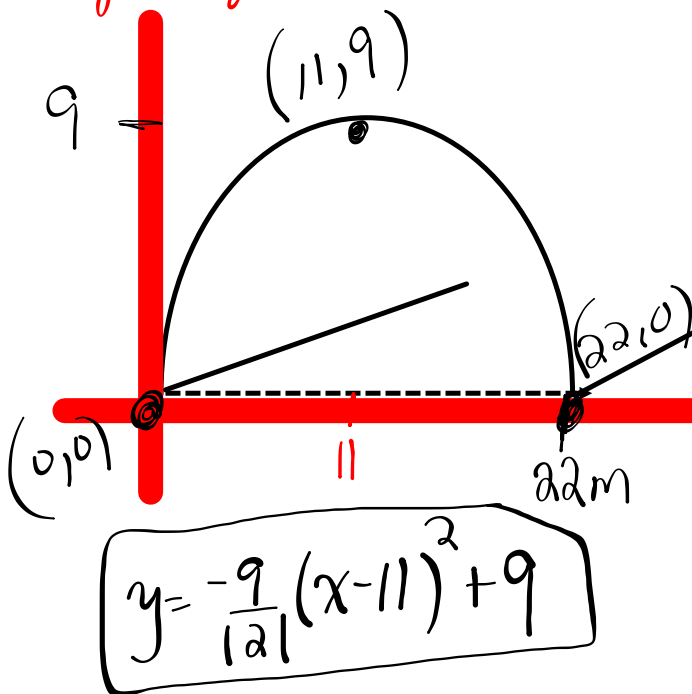
$$0.5 = 6.25a$$

$$\frac{0.5}{6.25} = a$$

$$0.08 = a$$

$$y = 0.08(x-2.5)^2 + 0.5$$

Tunnel is 22m wide. The max height of the tunnel is 9m.



vertex (11,9)  
 • point (22,0)

$$y = a(x-h)^2 + k$$

$$y = a(x-11)^2 + 9$$

$$0 = a(22-11)^2 + 9$$

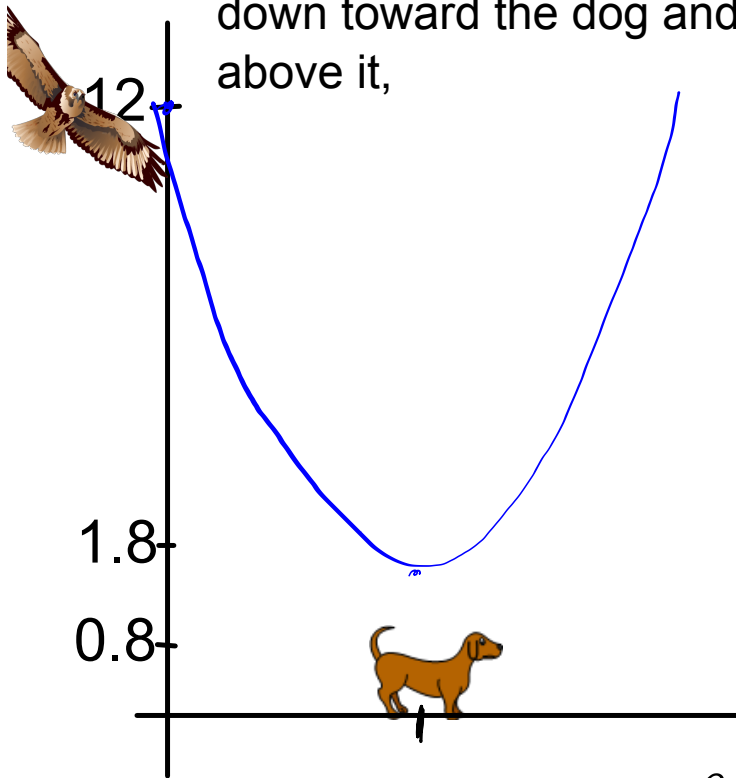
$$0 = a(11)^2 + 9$$

$$0 - 9 = 121a$$

$$\frac{-9}{121} = \frac{121a}{121}$$

$$\frac{-9}{121} = a$$

A hawk is hovering at an altitude of 12m. A dog is 5m horizontally from the hawk on the ground. If the dog is 0.8m high and the hawk swoops down toward the dog and misses it by flying 1m above it,



$$y = a(x - h)^2 + k$$

$$y = a(x - 5)^2 + 1.8$$

$$12 = a(10 - 5)^2 + 1.8$$

$$12 - 1.8 = a(-5)^2$$

$$\frac{10.2}{25} = \frac{25a}{25}$$

$$a = \frac{10.2}{25}$$

$$y = \frac{10.2}{25}(x - 5)^2 + 1.8$$



 review first part.doc

## Attachments

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review first part.doc