Applications of Quadratic Functions

A football is kicked straight up in the air. Its height is modeled by the following equation:

$$h = -5(t - 0)(t - 4)$$

where

- **h is the height of the football in metres.**
- **t is the time after the football was kicked in seconds.**

a) What was the height of the football 1 second after it was kicked?

b) What are the t-intercepts?

c) Expand the equation to express it in standard form.

d) What is the h-intercept?

e) Determine the vertex of the above function.

f) Use the above information to sketch a graph of height vs. time.

g) What was the maximum height of the football and when did it reach this height?

h) For how long was the football airborne?

Homework

1. A football is kicked straight up in the air. Its height is modeled by the following equation:

$$h = -5(t - 0)(t - 8)$$

a) **What was the height of the football 1 second after it was kicked?**
b) **What are the t-intercepts?**
c) **Expand the equation to express it in standard form.**
d) **What is the h-intercept?**
e) **Determine the vertex of the above function.**
f) **Use the above information to sketch a graph of height vs. time.**
g) **What was the maximum height of the football and when did it reach this height?**
h) **For how long was the football airborne?**

2. A flare is launched from the deck of a ship straight up in the air. Its height *above the water* is modeled by the following equation:

$$h = -5(t + 1)(t - 11)$$

a) **What are the t-intercepts?**
b) **Expand the equation to express it in standard form.**
c) **What is the h-intercept?**
d) **Determine the vertex of the above function.**
e) **Use the above information to sketch a graph of height vs. time.**
f) **What was the maximum height of the flare and when did it reach this height?**
g) **For how long was the flare airborne?**
h) **How high is the deck above the water ?**
Hint: t=0 when the flare is the same height as the deck.