3.5 Equations in Vertex Form

Ex 1   A video tracking device recorded the height, h, in meters, of a baseball after it was hit. The data collected can be modelled by the relation: h= -5(t - 2) ^{2} + 21, where t is the time in seconds after the ball was hit.

a)   Sketch the relation

b) What was the maximum height of the ball?

c) When did the maximum height occur?

d) How high was the ball after 1s? Determine another time when the ball was this height.

e) From what height was the ball hit?

Ex 2 Sketch each parable, then determine its equation. Algebraically determine the value of "a"

a) The parabola is 18 meters wide and reaches a maximum height of 10 meters.

Is there only one possible answer to this question? What would be the same? What would be different?
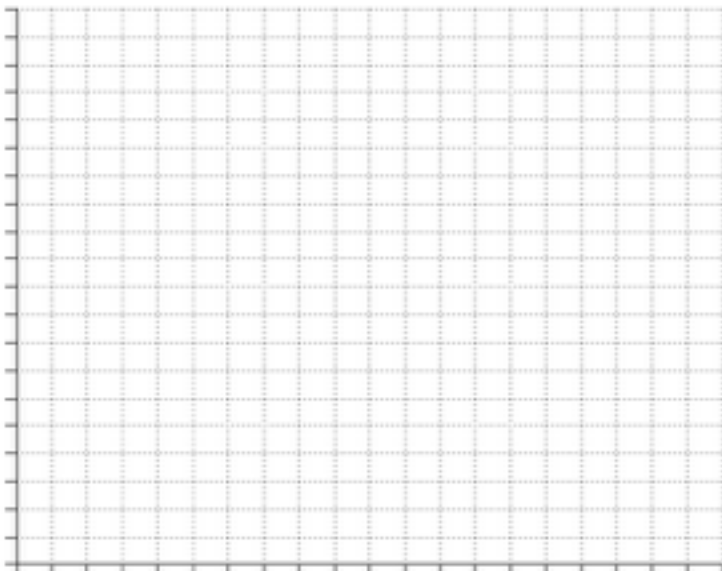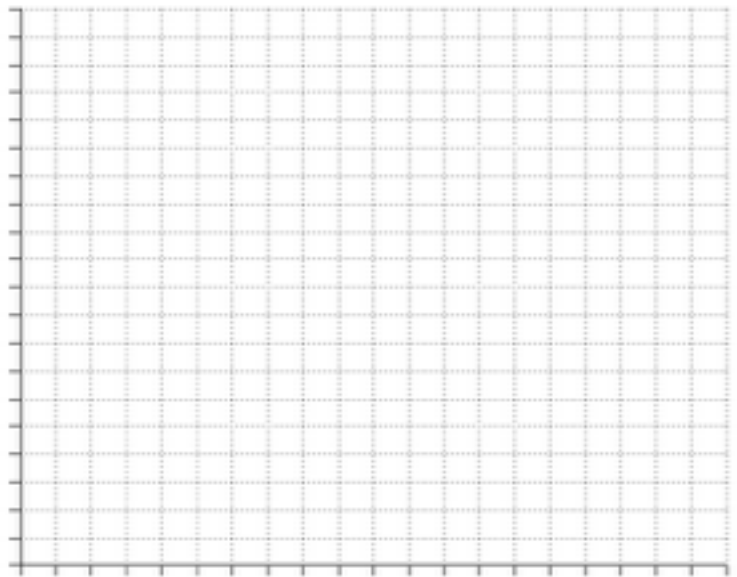
b) The parabola starts at the highest point of 30m. It drops to zero 9 meters to the right of the highest point.
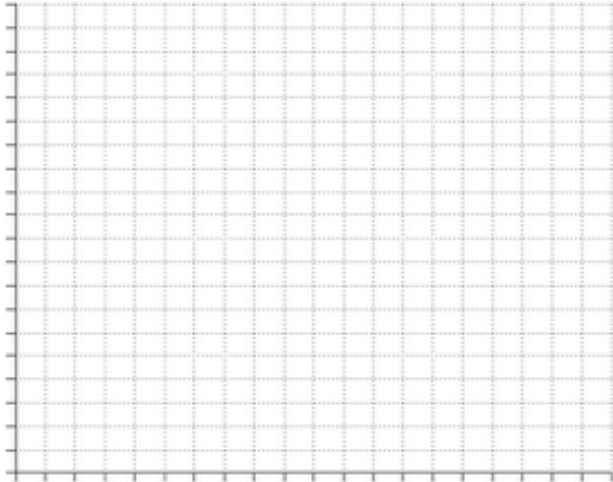
Ex 3 A projectile is launched from ground level and reaches a maximum height of 122.5 m after 5 seconds.

a) Write an equation to model this
     situation.
Find "a" algebraically.

b) When does the projectile hit the ground?

c) What is the projectiles height after 3 s? At what other time does it reach the same height

Ex 4 Find the equation of a parabola that has:

a) vertex at (-2,5) and goes through (1, -3)

b) Stretch factor of 2, reflected about the x-axis, equation of the axis of symmetry x= 3 and goes through the pain (2,5)