

CALCULATOR INACTIVE

Full marks are not necessarily awarded for a correct answer with no working. Answers must be supported by working and/or explanations. Where an answer is incorrect, some marks may be given for a correct method, provided this is shown by written work. You are advised to show all working.

1. The equation of a parabola is given to you as $f(x) = -2(x + 3)(x - 5)$.(12 M)
 - a. Determine the zeroes of this parabola.
 - b. Find the equation of the axis of symmetry of this parabola.
 - c. Write the equation for this parabola in vertex form.
 - d. Write the equation of this parabola in standard form.
 - e. Sketch the parabola, labeling the vertex, the y-intercept and the x-intercepts.

2. Factor the following quadratic expressions:(4 M)
 - a. $x^2 - 9x - 36$
 - b. $4x^2 + 5x - 6$

CALCULATOR ACTIVE

Full marks are not necessarily awarded for a correct answer with no working. Answers must be supported by working and/or explanations. In particular, solutions found from a graphic display calculator should be supported by suitable working, e.g. if graphs are used to find a solution, you should sketch these as part of your answer. Where an answer is incorrect, some marks may be given for correct method, provided this is shown by written working. You are therefore advised to show all working.

3. A company called SAMSOONG introduces a new cell phone (called the MATH Quad X PHONE) and its PROFITS are modeled by the equation $P(m) = -5m^2 + 80m - 100$, where m is time in months (we will use $m = 0$ to represent January 1st) and P is the profit in millions of dollars (so that the ordered pair (10,200) means that in the month of November, the profit was \$200,000,000). The cell phone is sold for a period of 2 years.

(10 M)

- a. Graph the profit function on your TI-84. What window settings did you use?

Xmin = Ymin = Xmax = Ymax =

- b. Calculate the zeroes of the quadratic and interpret what they mean.

- c. Calculate the co-ordinates of the vertex and interpret what it means.

- d. Evaluate P when $m = 5$ and interpret what your answer means in the context of this problem.

- e. Solve for m when $P(m) = -25$ and interpret what your answer means in the context of this problem.