

MCF3MI

EXAM REVIEW

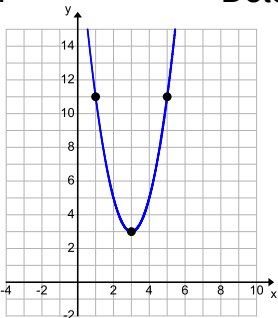
- Write each of the following in standard form.
 - $f(x) = (3x + 1)(x - 2)$
 - $f(x) = (2 + 3x)(x - 3)$
- Write each of the following in factored form.
 - $f(x) = x^2 - 16$
 - $f(x) = x^2 + 3x - 18$
 - $f(x) = 5x^2 - 20$
- Determine the zeros, the axis of symmetry, and the maximum and minimum value for each of the following quadratic equations. Show your work.
 - $f(x) = 3x^2 - 3x$
 - $f(x) = -4x^2 - 12x + 7$
- smile
- Can all quadratic equations be solved by factoring? Explain.
- Solve for x by factoring. Show your work.
 - $4x^2 + 4x - 3 = 0$
 - $x^2 + 6x - 3 = -3$
- A firecracker is fired from the ground. The height of the firecracker at a given time is modelled by the function $h(t) = -5t^2 + 40t$, where $h(t)$ is the height in metres and t is time in seconds.
 - When will the firecracker hit the ground?
 - What is the maximum height of the firecracker?
 - When does the firecracker reach a maximum height?
 - When will the firecracker reach a height of 75 m?
- The population of a city $P(t)$ is modeled by the function $P(t) = 0.5t^2 + 10t + 200$, where $P(t)$ is the population in thousands and t is time in years. NOTE: $t = 0$ represents the year 2000. According to the model,
 - in what year will the population reach 312 000?
 - will the population reach over 2 million people by the year 2050? Show your work.

CHAPTER 4: Quadratic Models: Standard & Vertex Forms

- Write the function $f(x) = 2(x + 3)^2 - 2$ in standard form.
- For the function $f(x) = -(x - 4)^2 + 1$, complete the table:

Vertex	
Axis of Symmetry	
Max/Min Value	
Domain	
Range	

- Determine the equation of the parabola .



- Write each function in vertex form and state the vertex.
 - $f(x) = -x^2 + 6x + 7$
 -

$g(x) = 2x^2 - 3x + 3.5$

- The cost, $C(n)$, of operating a cement-mixing truck is modeled by the function

$C(n) = 2.2n^2 - 66n + 700$, where n is the number of minutes the truck

is running.

What is the minimum cost of operating the truck? Show your work.

- Solve using the quadratic formula. State your answers correct to 2 decimal places.
 - $8x^2 - 6x + 1 = 0$
 - $x^2 + 3x = 14$
- A theatre company's profit can be modeled by the function $P(x) = -60x^2 + 700x - 1000$ where x is the price of a ticket in dollars. What is the break-even price of the tickets?
- A model rocket is launched into the air. Its height, $h(t)$, in metres after t seconds is $h(t) = -5t^2 + 40t + 2$.
 - When is the rocket at a height of 62 m (correct to 2 decimal places)?
 - What is the height of the rocket after 6 seconds?
 - What is the maximum height of the rocket?

- Without solving, determine the number of solutions of each equation. Show your work for full marks.

- $x^2 - 5x + 9 = 0$
- $3x^2 - 5x - 9 = 0$
- $16x^2 - 8x + 1 = 0$