

Unit 5 – Mid Unit Review (before quadratic formula)

MPM 2D

- What value of k makes each quadratic expression a perfect square trinomial?
a) $x^2 - 10x + k$ b) $x^2 + 3x + k$
- Find the vertex of the following quadratics. Show an algebraic approach **and** using algebra tiles for part (a).
a) $y = x^2 + 10x + 6$ b) $y = -3x^2 + 6x + 1$ c) $y = 2x^2 - 18x - 18$
- Find the zeros.
a) $y = x^2 + 2x - 3$ b) $y = 4x^2 - 36$ c) $y = 2x^2 - 14x - 16$
d) $y = 16x^2 + 40x + 25$ e) $y = 3x^2 + 28x + 9$ f) $y = 2(x - 1)^2 - 18$
- A ball is kicked into the air and follows a path described by $h = -4.9t^2 + 6t + 0.6$ where t is the time in seconds and h is the height in metres.
a) How high is the ball off the ground when it is kicked?
b) What is the height of the ball after 1 second?
c) What is the maximum height of the ball, to the nearest tenth of a metre?
d) When does the ball reach the maximum height?
e) When does the ball return to its initial height, rounding to two decimal places?
- The length of a rectangle is 1 m more than the width. If the area of the rectangle is 20 m^2 , what are the dimensions of the rectangle?
- Sketch the following parabolas. State the direction of opening, the vertex, the equation of the axis of symmetry.
a) $y = 2(x - 4)(x + 2)$ b) $y = x^2 - 3$ c) $y = -x^2 - 6x - 13$ d) $y = 2x^2 - 4x$
- Given the parabola $y = 2x^2 + 4x - 6$, find:
a) The equation of the parabola in factored form.
b) The equation of the parabola in vertex form.
c) What are the x -intercepts?
d) Graph.
e) What information does standard form provide about this parabola?
- Find the equation of the parabola in vertex form that has x -intercepts of -1 and 3 , that passes through the point $(5, 6)$.

Answers:

- a) 25 b) $9/4$
- a) $(-5, -19)$ b) $(1, 4)$ c) $(9/2, -117/2)$
- a) $x = -3, 1$ b) $x = -3, 3$ c) $x = -1, 8$ d) $x = -5/4$ e) $x = -9, -1/3$ f) $x = 4, -2$
- a) 0.6 m b) 1.7 m c) 2.4 m d) after 0.6 seconds e) after 1.22 seconds
- $5 \times 4 \text{ m}$
- a) $v(1, -18)$ b) $v(0, -3)$ c) $v(-3, -4)$ d) $v(1, -2)$
- a) $y = 2(x + 3)(x - 1)$ b) $y = 2(x + 1)^2 - 8$ c) $x = -3, 1$ f) y -intercept is -6
- $y = \frac{1}{2}(x - 1)^2 - 2$