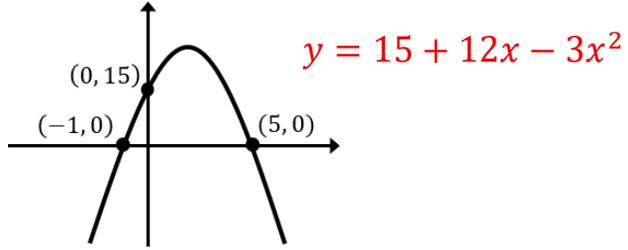# Quadratics Revision

(a)

Find the coordinates of the turning point of the curve with equation
$$y = 2x^2 + 7x - 3$$

$$\left(-\frac{7}{4}, -\frac{73}{8}\right)$$

(b)

Solve
$$5y = 4 - \sqrt{y}$$

$$y = \frac{16}{25}$$

(c)

Find the equation of the quadratic curve.

$(0, 15)$
$(-1, 0)$ $(5, 0)$

$$y = 15 + 12x - 3x^2$$

(d)

Given that the line $y = 2x - 5$ intersects the curve $y = 3x^2 + ax - 1$ at two points, find the possible range of values for a.

$$a > 2 + 4\sqrt{3} \text{ or } a < 2 - 4\sqrt{3}$$

(e)

Find the set of values for which
$5 - 2x \geq 3x + 1$ and $8x^2 < 3 + 10x$.
Give your answer in set notation.

$$\left\{x : x > -\frac{1}{4}\right\} \cap \left\{x : x \leq \frac{4}{5}\right\}$$

(f)

Solve the simultaneous equations
$$x - y = 8$$
$$2x - y^2 - 1 = 0$$

$$x = 13, y = 5 \text{ or } x = 5, y = -3$$

(g)

A quadratic curve and a line form a region shaded on the graph shown. Find the single inequality which describes the region.

$(-5, 7)$
$(2, 0)$
$(-1, -9)$
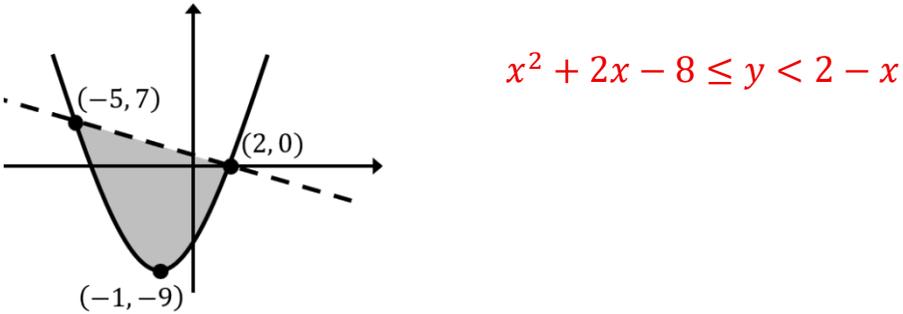
$$x^2 + 2x - 8 \leq y < 2 - x$$

(h)

The path of a tennis ball through the air can be modelled as a curve with equation $h = 0.608 + 0.72x - 0.05x^2$ where h is the height of the ball and x is the horizontal distance from the tennis player.

(a) Find the height of the ball when it has travelled 2 m horizontally.
(b) Find the horizontal distance of the ball from the tennis player when it hits the ground.
(c) Find the maximum height of the tennis ball.

(a) 1.848 m
(b) 15.2 m
(c) 3.2 m