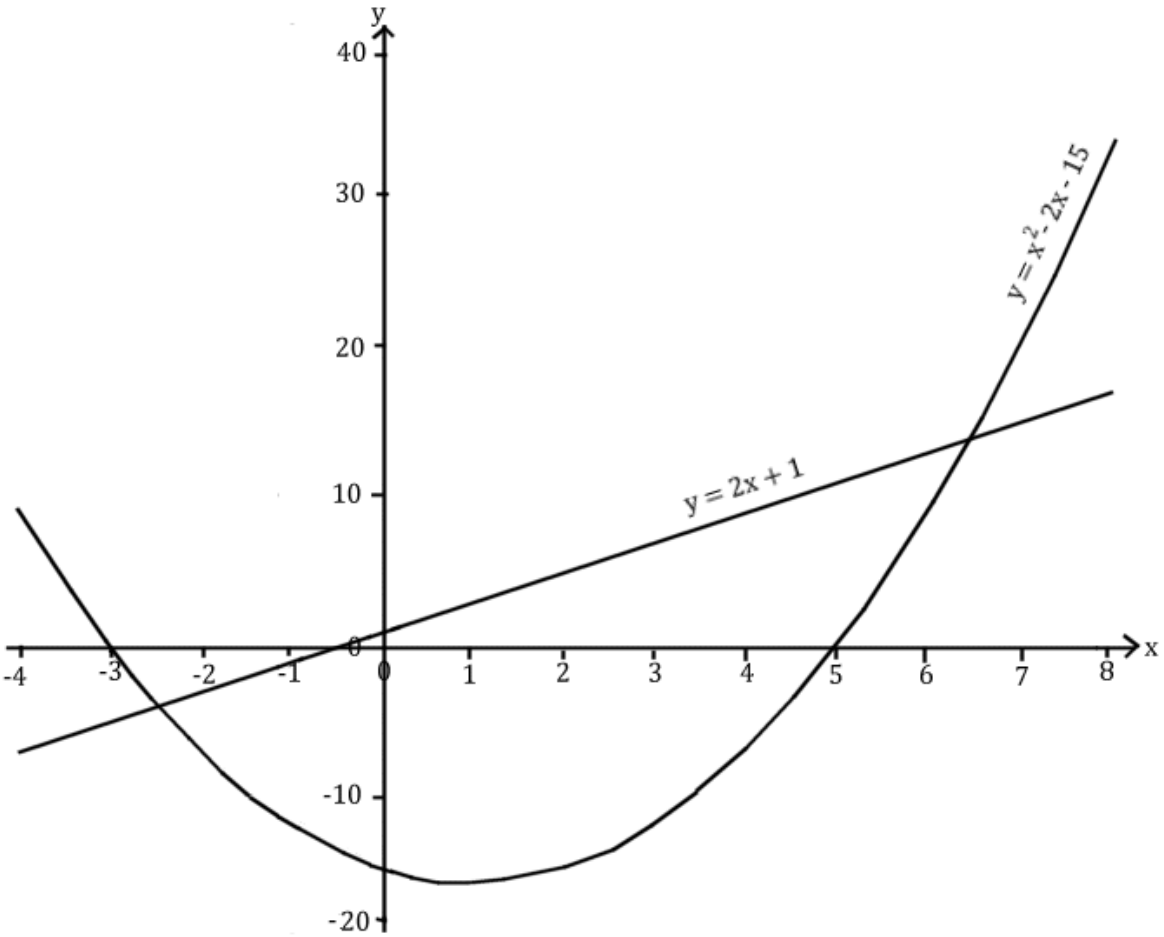
# Solving Quadratic Equations – ANSWERS

1.




2. The intercepts with the x-axis are at $-3$ and $5$

3. $x^2 - 2x - 15 = 0$
$(x + 3)(x - 5) = 0$
$x + 3 = 0$ or $x - 5 = 0$
$x = -3$ or $x = 5$

4. $x^2 - 2x - 15 = 0$
$x^2 - 2x + 1 - 15 - 1 = 0$
$(x - 1)^2 - 16 = 0$
$(x - 1)^2 = 16$
$x - 1 = \pm 4$
$x - 1 = -4$ or $x - 1 = 4$
$x = -3$ or $x = 5$

5. Substituting in the formula $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
$x = \frac{--2 \pm \sqrt{2^2 - 4 \times 1 \times -15}}{2 \times 1}$
$x = \frac{2 \pm \sqrt{4 - -60}}{2}$
$x = \frac{2 \pm \sqrt{64}}{2}$
$x = \frac{2-8}{2}$ or $x = \frac{2+8}{2}$
$x = -3$ or $x = 5$

6. $x^2 - 4x - 16 = 0$
If $2x + 1$ is added to both sides of the equation like this: $x^2 - 4x - 16 + 2x + 1 = 2x + 1$
it gives: $x^2 - 2x - 15 = 2x + 1$
So, if we draw the graph of $y = 2x + 1$ on the same axes as $y = x^2 - 2x - 1$, where the curves intersect it will be true that:
$x^2 - 2x - 15 = 2x + 1$
and that:
$x^2 - 4x - 16 = 0$

7. Substituting in the formula $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
$x = \frac{--4 \pm \sqrt{4^2 - 4 \times 1 \times -16}}{2 \times 1}$
$x = \frac{4 \pm \sqrt{4 - -64}}{2}$
$x = \frac{4 \pm \sqrt{80}}{2}$
$x = \frac{4-8.9}{2}$ or $x = \frac{4+8.9}{2}$
$x = \frac{-4.9}{2}$ or $x = \frac{12.9}{2}$
$x = -2.45$ or $x = 6.45$
(Confirm that your graphical solution is correct.)