BRIDGE Day 5
Independent Practice
Lines, tangents and curves

KING'S MATHS SCHOOL

1 Solve simultaneously:

a) $y = x^2 - 4x - 2$, $y = 2x - 11$

b) $y = x^2 - 4x - 2$, $y = -x - 6$

c) $y = x^2 - 4x - 2$, $y = 0.5x - 4$

d) $y = x^2 - 4x - 2$, $x = 3y - 4$

Describe each answer using graphical language.

2 Solve simultaneously:

a) $x^2 - y^2 = 12$, $y = 2x - 6$

b) $x^2 - y^2 = 12$, $x = 2y + 8$

c) $x^2 - y^2 = 12$, $y = x - 6$

d) $x^2 - y^2 = 12$, $y = 3x - 6$

Describe each answer using graphical language.

3 Which of the lines $y = x - 2$ and $y = -0.5x + 4$ is a tangent to $x^2 + 4y^2 = 32$?

4 Show that both of the lines $y = x + 6$ and $y = -x - 6$ are tangents to the circle with equation $x^2 + y^2 = 18$.

Are there any other lines with gradient 1 or -1 that are tangents to this circle?

Draw a picture showing what you have found out.

5 In Q4 you showed that the circle with equation $x^2 + y^2 = 18$ is enclosed by a square formed by four lines. Now show that the same four lines also enclose the ellipse with equation $x^2 + 2y^2 = 24$.