Mathematical Problem Solving
GCSE example

Solution to example 8

Problem A	**Problem B**
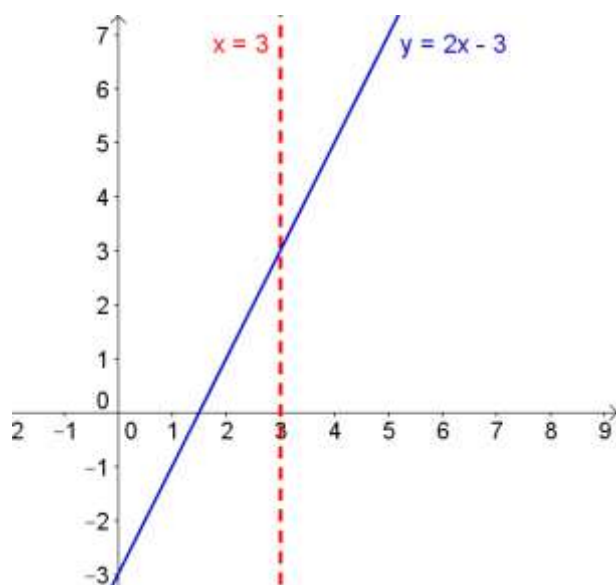
(i) Reflect the line $y = 2x - 3$ in the line $x = 3$. What is the equation of the new line?
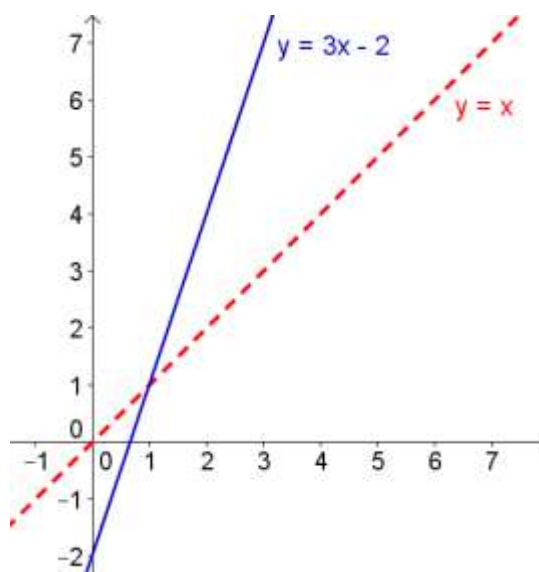
(i) Reflect the line $y = 3x - 2$ in the line $y = x$.

What is the equation of the new line?

(ii)

   a) What equation would you get if you reflect the line $y = 2x - 3$ in $x = 4$?

   b) Is there a rule for reflecting $y = 2x - 3$ in any line of the form $x = k$?

(ii)

   a) What equation would you get if you reflect the line $y = 5 - 2x$ in $y = x$?

   b) Is there a rule for reflecting a line of the form $y = mx + c$ in the line $y = x$?

Problem A

(i)

Gradient $= -2$

Passes through $(3,3)$

$y - 3 = -2(x - 3)$

$y - 3 = -2x + 6$

$y = -2x + 9$

(ii)

a) Gdt $= -2$. Passes through $(4,5)$

$y - 5 = -2(x - 4)$

$y - 5 = -2x + 8$

$y = -2x + 13$

b) Gdt $= -2$. Passes through $(k, 2k - 3)$

$y - (2k - 3) = -2(x - k)$

$y - 2k + 3 = -2x + 2k$

$y = -2x + 4k - 3$

Problem B

(i)

$x = 3y - 2$

$3y = x + 2$

$y = \frac{1}{3}x + \frac{2}{3}$

(ii)

a) $x = 5 - 2y$

$2y = -x + 5$

$y = -\frac{1}{2}x + \frac{5}{2}$

b) $x = my + c$

$my = x - c$

$y = \frac{1}{m}x - \frac{c}{m}$