1 Find x for each function.

(a) $y = 9x - 13;\ y = 50$ (1)

(b) $y = \frac{x}{3} + 8;\ y = 14$ (1)

(c) $y = 5(x - 2);\ y = 45$ (1)

(d) $y = 20 - 3x;\ y = 2$ (1)

(4 marks)

2 For each function, write the inverse as an equation giving x in terms of y.

(a) $y = x + 7$ (1)

(b) $y = 6x$ (1)

(c) $y = 2x + 5$ (2)

(4 marks)

3 A machine multiplies the input by itself.

(a) What comes out when 6 goes in? (1)

(b) What comes out when -6 goes in? (1)

(c) What went in if 36 came out? (2)

(d) Explain why this machine has no inverse (2)

(6 marks)

4 A machine adds 4 and then multiplies by 3. A second machine multiplies by 3 and then adds 4.

(a) What comes out of each when 2 goes in? (2)

(b) Write each machine as an equation (2)

(c) Write down the inverse of each, in the right order (2)

(6 marks)

5 Find a machine, other than *subtract from* 8, that is its own inverse.

(4 marks)

6 **Extension.** A machine multiplies by 2 and adds 3. Its output is fed straight into a second machine that subtracts 1 and divides by 2.

(a) What comes out of the second machine when 4 goes into the first? (2)

(b) What comes out when 10 goes into the first? (2)

(c) Write down what the two machines together do to a number (2)

(6 marks)