

## Algebra

1) Expand and simplify

a)  $2(3x - 1)$

b)  $2x(4x + 2)$

c)  $(x + 1)(x + 5)$

d)  $(x - 2)^2$

e)  $(2x - 1)(x + 3)$

f)  $(x - 7)(x - 6)$

2) Make  $x$  the subject of the following formulae

a)  $mx + c = y$

b)  $\frac{x}{t} - c = y$

c)  $2x - 1 = t$

d)  $\frac{x+t}{c} = m$

e)  $t + x = r^2$

f)  $m(2x - 1) = t$

3) Factorise fully

a)  $4x - 6$

b)  $3x^2 + 6x$

c)  $9x + 3$

d)  $x^3 + 5x^2$

e)  $16x^3y - 12x^2y^2$

4) If  $a = 4$   $b = -2$   $c = 5$   $x = -1$  find:

a)  $ax^2$

b)  $ab - cx$

c)  $\frac{2a-7}{c-x}$

d)  $x + \sqrt{a + c}$

e)  $a^2 + (b + x)^2$

5) Solve for  $x$

a)  $3x - 5 = 8$

b)  $\frac{x}{4} + 2 = 5$

c)  $5 - 3x = 11$

d)  $4(2x - 3) = 6$

e)  $5x - 1 = 3x + 7$

f)  $8 - 2x = 5 + x$

g)  $4 - 2x = 9 - 5x$

h)  $3(2x - 1) = 3$

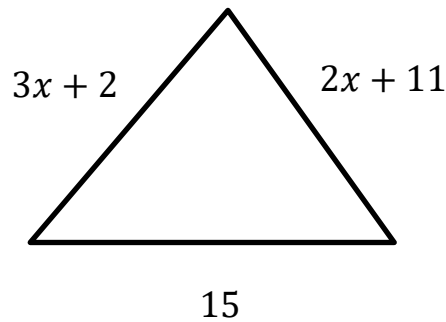
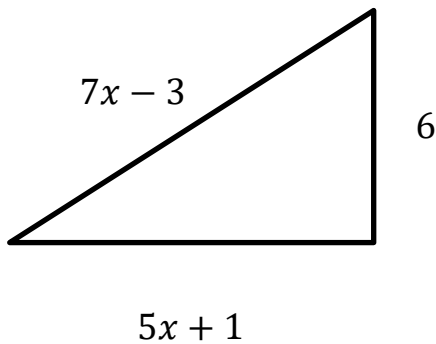
i)  $3(2x + 1) = 5(1 - 2x)$

j)  $\frac{2x-1}{3} = 5$

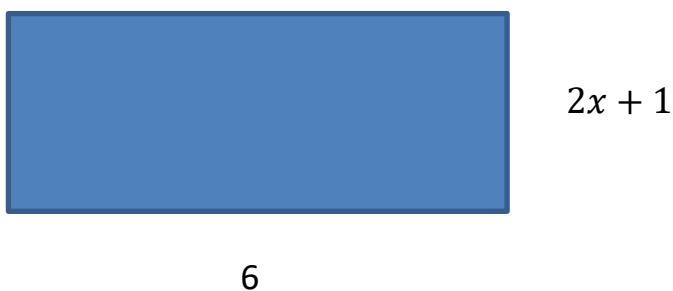
k)  $\frac{x+5}{3} - 4 = 1$

6) I think of a number, multiply it by 4 and add 6, the answer is 17. Find my original number.

- 7) I think of a number, subtract 5 and multiply by 3, the answer is 15. Find my original number.
- 8) The perimeter of these two triangles are equal, find  $x$



- 9) The area of the following rectangle is  $40\text{cm}^2$ . Find  $x$



- 10) The height of a rectangle is  $2y + 1$  and the base is 5. By writing the area of the rectangle as  $A$ , write down a formula linking  $y$  and  $A$ .

Make  $y$  the subject of this formula

### Answers

- 1a)  $6x - 2$  b)  $8x^2 + 4x$  c)  $x^2 + 6x + 5$  d)  $x^2 - 4x + 4$  e)  $2x^2 + 5x - 3$   
 f)  $x^2 - 13x + 42$  2a)  $\frac{y-c}{m}$  b)  $t(y + c)$  c)  $\frac{t+1}{2}$  d)  $mc - t$  e)  $r^2 - t$  f)  $\frac{t+m}{2m}$   
 3a)  $2(2x - 3)$  b)  $3x(x + 2)$  c)  $3(3x + 1)$  d)  $x^2(x + 5)$  e)  $4x^2y(4x - 3y)$   
 4a) 4 b) -3 c)  $\frac{1}{6}$  d) 2 e) 25 5a)  $\frac{13}{3}$  b) 12 c) -2 d)  $\frac{9}{4}$  e) 4 f) 1 g)  $\frac{5}{3}$  h) 1 i)  $\frac{1}{8}$  j) 8 k)  
 10) 6)  $\frac{11}{4}$  7) 10 8)  $\frac{24}{7}$  9)  $\frac{17}{6}$  10)  $A = \frac{5(2y+1)}{2}$ .....  $y = \frac{2A-5}{10}$