

## Extra questions – Maths Transition work

### Expanding brackets and simplifying expressions

1 Expand.

a  $3(2x - 1)$

b  $-2(5pq + 4q^2)$

c  $-(3xy - 2y^2)$

2 Expand.

a  $3x(4x + 8)$

b  $4k(5k^2 - 12)$

c  $-2h(6h^2 + 11h - 5)$

d  $-3s(4s^2 - 7s + 2)$

3 Expand and simplify.

$3(y^2 - 8) - 4(y^2 - 5)$

4 Expand  $\frac{1}{2}(2y - 8)$

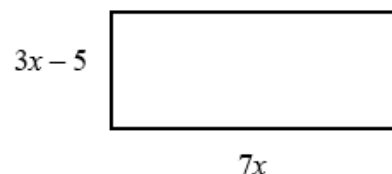
5 Expand and simplify.

$13 - 2(m + 7)$

6 The diagram shows a rectangle.

Write down an expression, in terms of  $x$ , for the area of the rectangle.

Show that the area of the rectangle can be written as  $21x^2 - 35x$



7 Expand and simplify.

a  $(x + 4)(x + 5)$

b  $(x + 7)(x + 3)$

c  $(x + 7)(x - 2)$

d  $(x + 5)(x - 5)$

e  $(3x + 4y)(5y + 6x)$

8 Rationalise and simplify, if possible.

a  $\frac{1}{\sqrt{5}}$

b  $\frac{1}{\sqrt{11}}$

c  $\frac{2}{\sqrt{7}}$

d  $\frac{2}{\sqrt{8}}$

e  $\frac{2}{\sqrt{2}}$

f  $\frac{5}{\sqrt{5}}$

g  $\frac{\sqrt{8}}{\sqrt{24}}$

h  $\frac{\sqrt{5}}{\sqrt{45}}$

## Factorising expressions

9 Simplify

a  $\frac{9x^2 - 16}{3x^2 + 17x - 28}$

b  $\frac{2x^2 - 7x - 15}{3x^2 - 17x + 10}$

c  $\frac{4 - 25x^2}{10x^2 - 11x - 6}$

d  $\frac{6x^2 - x - 1}{2x^2 + 7x - 4}$

## Solving quadratic equations by factorisation

10 Solve

a  $6x^2 + 4x = 0$

b  $28x^2 - 21x = 0$

c  $x^2 + 7x + 10 = 0$

d  $x^2 - 5x + 6 = 0$

e  $x^2 - 3x - 4 = 0$

f  $x^2 + 3x - 10 = 0$

g  $x^2 - 10x + 24 = 0$

h  $x^2 - 36 = 0$

i  $x^2 + 3x - 28 = 0$

j  $x^2 - 6x + 9 = 0$

k  $2x^2 - 7x - 4 = 0$

l  $3x^2 - 13x - 10 = 0$

## Linear inequalities

11 Solve these inequalities.

a  $4x > 16$

b  $5x - 7 \leq 3$

c  $1 \geq 3x + 4$

d  $5 - 2x < 12$

e  $\frac{x}{2} \geq 5$

f  $8 < 3 - \frac{x}{3}$

## Parallel and perpendicular lines

12 Find the equation of the line perpendicular to  $y = \frac{1}{2}x - 3$  which passes through the point  $(-5, 3)$ .

### Hint

If  $m = \frac{a}{b}$  then the negative

reciprocal  $-\frac{1}{m} = -\frac{b}{a}$

## Answers- Extra questions – Summer holiday work

1 a  $6x - 3$       b  $-10pq - 8q^2$       c  $-3xy + 2y^2$

2 a  $12x^2 + 24x$       b  $20k^3 - 48k$   
c  $10h - 12h^3 - 22h^2$       d  $21s^2 - 21s^3 - 6s$

3  $-y^2 - 4$

4  $y - 4$

5  $-1 - 2m$

6  $7x(3x - 5) = 21x^2 - 35x$

7 a  $x^2 + 9x + 20$       b  $x^2 + 10x + 21$       c  $x^2 + 5x - 14$

d  $x^2 - 25$       e  $18x^2 + 39xy + 20y^2$

8 a  $\frac{\sqrt{5}}{5}$       b  $\frac{\sqrt{11}}{11}$       c  $\frac{2\sqrt{7}}{7}$       d  $\frac{\sqrt{2}}{2}$   
e  $\sqrt{2}$       f  $\sqrt{5}$       g  $\frac{\sqrt{3}}{3}$       h  $\frac{1}{3}$

9 a  $\frac{3x+4}{x+7}$       b  $\frac{2x+3}{3x-2}$   
c  $\frac{2-5x}{2x-3}$       d  $\frac{3x+1}{x+4}$

10 a  $x = 0$  or  $x = -\frac{2}{3}$       b  $x = 0$  or  $x = \frac{3}{4}$   
c  $x = -5$  or  $x = -2$       d  $x = 2$  or  $x = 3$   
e  $x = -1$  or  $x = 4$       f  $x = -5$  or  $x = 2$   
g  $x = 4$  or  $x = 6$       h  $x = -6$  or  $x = 6$   
i  $x = -7$  or  $x = 4$       j  $x = 3$   
k  $x = -\frac{1}{2}$  or  $x = 4$       l  $x = -\frac{2}{3}$  or  $x = 5$

11 a  $x > 4$       b  $x \leq 2$       c  $x \leq -1$       d  $x > -\frac{7}{2}$       e  
 $x \geq 10$       f  $x < -15$

12  $y = -2x - 7$