

**WEEK: 20**

**Week Beginning: (03/08/20)**

**Subject: MATHS**

**Year: 8**

### **Lesson Objective:**

- Develop our knowledge on changing the subject
- To expand this onto working with Quadratics

### **Class Worksheets**

- Pages 1 to 7 from the Learning Pack – see below

### **Homework**

- Page 8 from the Learning Pack – see below

### **Additional Notes**

- All lesson worksheets and **homework for next week (due Week 21)** worksheets can be found below
- Week 19 homework will be marked in lesson hence make sure it is fully complete

**Please print 2 a page or open this document during the lesson to save paper!**

1.  $4x = 4$
2.  $x + 6 = -7$
3.  $x - 4 = 7$
4.  $\frac{x}{3} = -9$
5.  $2x + 4 = 8$
6.  $14 = 3 + 2x$
7.  $8x - 3 = -19$
8.  $6 - x = 9$
9.  $-x = -12$
10.  $3(x - 2) = 6$
11.  $-3(2x - 8) = -12$
12.  $4(6 + 2x) = 0$
13.  $3x + 2x + 6 = -15$
14.  $4 = -2(x + 3)$
15.  $27 = 46 + 2x - x$
16.  $4x + 6 - 7x + 9 = 18$
17.  $4 + 3(x + 2) = 10$
18.  $-3 + 3x = -2(x + 1)$
19.  $9x - 6 = -3x + 30$
20.  $-(x + 2) = 2(3x - 6)$
21.  $2x + 6 = 3x + 9 - 3$
22.  $-5x + 3 = 2x + 10$
23.  $3x - 12x = 24 - 9x$
24.  $2(x + 4) = -3(x + 5)$
25.  $4(2x - 3) + 4 = 8x - 8$
26.  $6x + 11 = -(6x + 5)$
27.  $2(x + 7) = 6x + 9 - 4x$
28.  $-5(3 - 4x) = -6 + 20x - 9$
29.  $4(x - 3) - (x - 5) = 0$
30.  $-2(4 - x) = 6(x + 2) + 3x$
31.  $\frac{4}{7} = \frac{x}{21}$
32.  $\frac{x}{4} = \frac{-20}{16}$
33.  $\frac{9c}{10} = \frac{9}{5}$
34.  $\frac{1}{4} = \frac{z+1}{4}$
35.  $\frac{a}{5} = \frac{a-3}{2}$
36.  $\frac{n}{10} = 9 - \frac{n}{5}$
37.  $\frac{2}{8} + \frac{3}{4} = \frac{w}{5}$
38.  $x - \frac{3}{4} = -2x$
39.  $\frac{x}{4} - \frac{x}{6} = \frac{1}{4}$
40.  $a - \frac{a}{3} + \frac{a}{5} = 26$
41.  $\frac{12}{10} = \frac{z}{25}$
42.  $\frac{-2}{6} = \frac{3c}{9}$
43.  $\frac{x+4}{7} = \frac{3}{7}$
44.  $\frac{4x+5}{6} = \frac{7}{2}$
45.  $6 - \frac{x}{4} = \frac{x}{8}$
46.  $\frac{x}{3} - \frac{3x}{4} = \frac{1}{12}$
47.  $\frac{5}{2} - x = 3x$
48.  $\frac{3-5y}{4} = \frac{2-4y}{3}$
49.  $\frac{2x-1}{3} - \frac{3x}{4} = \frac{5}{6}$
50.  $-\frac{x}{4} = 12$
51.  $-x = -12$
52.  $-2x = -16$
53.  $2x = -14$
54.  $\frac{1}{7}x = -8$
55.  $\frac{1}{7}x = 2$
56.  $-\frac{x}{2} = 4$
57.  $-x = 26$
58.  $3x = 15$
59.  $4x = -32$
60.  $\frac{1}{3}x = 5$



2. In each case, make the letter at the end the subject of the formula.

a)  $y = mx + c$ , ( $c$ )

d)  $2s = 2ut + at^2$ , ( $a$ )

b)  $y = mx + c$ , ( $m$ )

e)  $v^2 = u^2 + 2as$ , ( $a$ )

c)  $v^2 = u^2 + 2as$ , ( $s$ )

f)  $y = a^2x + b^2$ , ( $x$ )

1. Rearrange  $a(q - c) = d$  to make  $q$  the subject.

2. (a) Make  $n$  the subject of the formula  $m = 5n - 21$

(b) Make  $p$  the subject of the formula  $4(p - 2q) = 3p + 2$

3.  $P = \pi r + 2r + 2a$

Make  $r$  the subject of the formula

4. Make  $a$  the subject of the formula

$$2(3a - c) = 5c + 1$$

5. Make  $m$  the subject of the formula  $2(2p + m) = 3 - 5m$

6. Make  $x$  the subject of

$$5(x - 3) = y(4 - 3x)$$

7. When you are  $h$  feet above sea level, you can see  $d$  miles to the horizon, where

$$d = \sqrt{\frac{3h}{2}}$$

Make  $h$  the subject of the formula

8.  $y = \frac{2pt}{p - t}$

Rearrange the formula to make  $t$  the subject.

9. Make  $b$  the subject of the formula  $a = \frac{2 - 7b}{b - 5}$

10.  $P = \frac{n^2 + a}{n + a}$

Rearrange the formula to make  $a$  the subject.

11. 
$$\frac{x}{x+c} = \frac{p}{q}$$

Make  $x$  the subject of the formula.

12. Rearrange  $\frac{1}{u} + \frac{1}{v} = \frac{1}{f}$

to make  $u$  the subject of the formula.

Give your answer in its simplest form.

# Factorising Quadratic Expressions 3

**Section A:** Simplify then factorise the following quadratic expressions.

1)  $x^2 - 6x - 2x + 12$

2)  $d(d - 5) - 84$

3)  $b^2 + 2(b - 4)$

4)  $x^2 - 3(2x + 9)$

5)  $c(c + 8) - 48$

6)  $3a(a - 2) - 4a + 3$

7)  $5w(w - 2) - 4w - 3$

8)  $3(6 - 5s) + s^2 + s^2$

9)  $3 - 2y(4y + 5)$

10)  $9x^2 - (x - 3)^2$

**Section B:** Factorise the following algebraic expressions.

1)  $x^2 - 4$

2)  $s^2 - 25$

3)  $t^2 - 64$

4)  $9 - y^2$

5)  $49 - p^2$

6)  $4q^2 - 121$

7)  $81 - 25k^2$

8)  $1 - 400d^2$

9)  $600v^2 - 6$

10)  $a^2 - b^2$

11)  $x^2 - 9y^2$

12)  $4c^2 - d^2$

13)  $16s^2 - 9t^2$

14)  $49w^2 - 100v^2$

15)  $32p^2 - 18q^2$

16)  $48x^2 - 12y^2$

17)  $45a^2 - 125b^2$

18)  $72x^2 - 242y^2$

19)  $a^2b^2 - c^2$

20)  $9s - 4s^3$

21)  $(xy)^2 - 4z^2$

22)  $64t^4 - 16s^4$

23)  $(4x^2)^2 - 36y^2$

24)  $27a^4 - 12b^2$

**Extension:** Using the difference of two squares factorise the following expressions

A.  $4x^2 - (x - 2)^2$

B.  $(2x + 1)^2 - (x - 4)^2$

1) Factorise

(a)  $x^2 + 5x + 6$

(b)  $x^2 + 6x + 9$

(c)  $x^2 + 8x + 7$

(d)  $x^2 + 8x + 15$

(e)  $x^2 + 4x + 3$

(f)  $x^2 + 12x + 20$

2) Factorise

(a)  $x^2 - 6x + 5$

(b)  $x^2 - 2x + 1$

(c)  $x^2 - 7x + 10$

(d)  $x^2 - 2x + 1$

(e)  $x^2 - 8x + 15$

(f)  $x^2 - 11x + 18$

3) Factorise

(a)  $x^2 - x - 6$

(b)  $x^2 - 2x - 15$

(c)  $x^2 - 3x - 18$

(d)  $x^2 - 2x - 24$

(e)  $x^2 - 8x - 20$

(f)  $x^2 - 6x - 5$

4) Factorise

(a)  $x^2 + x - 6$

(b)  $x^2 + x - 30$

(c)  $x^2 + 3x - 40$

(d)  $x^2 + x - 20$

(e)  $x^2 + 7x - 18$

(f)  $x^2 + 4x - 60$

5) Factorise

(a)  $2x^2 + 5x + 2$

(b)  $2x^2 - 3x + 1$

(c)  $3x^2 + 5x + 2$

(d)  $2x^2 - 3x - 2$

(e)  $3x^2 + 8x + 4$

(f)  $5x^2 - 17x + 6$



1. Factorise Fully:

- a)  $x^2+3x+2 = ( \quad + \quad )( \quad + \quad )$
- b)  $x^2+6x+9 = ( \quad + \quad )( \quad + \quad )$
- c)  $x^2+6x+8 = ( \quad + \quad )( \quad + \quad )$
- d)  $x^2+13x+22 = ( \quad + \quad )( \quad + \quad )$
- e)  $x^2+7x+10 = ( \quad + \quad )( \quad + \quad )$
- f)  $x^2+8x+15 = ( \quad + \quad )( \quad + \quad )$
- g)  $x^2+7x+12 = ( \quad + \quad )( \quad + \quad )$
- h)  $x^2+7x+6 = ( \quad + \quad )( \quad + \quad )$

2. Factorise Fully:

- a)  $x^2-7x+10 = ( \quad - \quad )( \quad - \quad )$
- b)  $x^2-8x+12 = ( \quad - \quad )( \quad - \quad )$
- c)  $x^2-13x+12 = ( \quad - \quad )( \quad - \quad )$
- d)  $x^2-12x+20 = ( \quad - \quad )( \quad - \quad )$
- e)  $x^2-11x+24 = ( \quad - \quad )( \quad - \quad )$
- f)  $x^2-13x+36 = ( \quad - \quad )( \quad - \quad )$
- g)  $x^2-14x+40 = ( \quad - \quad )( \quad - \quad )$
- h)  $x^2-10x+21 = ( \quad - \quad )( \quad - \quad )$

3. Factorise Fully:

- a)  $x^2+x-20 = ( \quad + \quad )( \quad - \quad )$
- b)  $x^2+3x-18 = ( \quad + \quad )( \quad - \quad )$
- c)  $x^2+5x-24 = ( \quad + \quad )( \quad - \quad )$
- d)  $X^2-6x-40 = ( \quad + \quad )( \quad - \quad )$
- e)  $X^2-x-42 = ( \quad + \quad )( \quad - \quad )$
- f)  $X^2-13x-30 = ( \quad + \quad )( \quad - \quad )$
- g)  $X^2+3x-24 = ( \quad + \quad )( \quad - \quad )$
- h)  $X^2-7x-18 = ( \quad + \quad )( \quad - \quad )$

4. Factorise Fully:

- a)  $x^2+x+1 =$
- b)  $x^2+7x+10 =$
- c)  $x^2+8x-20 =$
- d)  $X^2-7x-30 =$
- e)  $X^2-9x+20 =$
- f)  $X^2-8x+12 =$
- g)  $X^2+3x-40 =$
- h)  $X^2-6x-7 =$