Factorisation

1. (a) Factorise completely $10a - 25ab$

$$= 5a(2 - 5b)$$

(b) Factorise $x^2 - 3x - 10$

$$= (x-5)(x+2)$$

x — 5
x + 2

(c) Factorise completely $50x^2 - 72y^2$

$$= 2(25x^2 - 36y^2)$$
$$= 2(5x - 6y)(5x + 6y)$$

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2. Factorise completely $2x^2 - 6xy + 5wx - 15wy$

$$2x(x-3y) + 5w(x-3y)$$
$$(2x+5w)(x-3y)$$

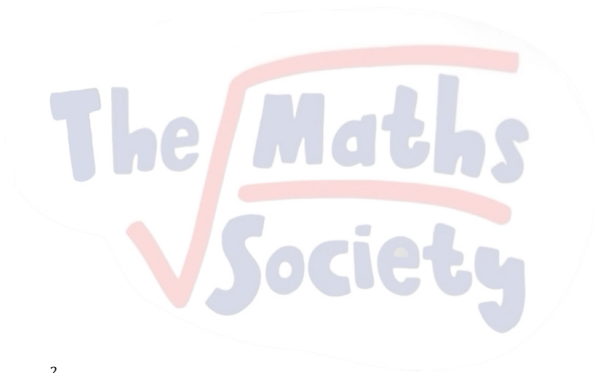3. Factorise fully $14x^2y^3 - 21x^5y^2$

$$7x^2y^2(2y - 3x^3)$$

4. Factorise $x^2 - 1$

$$(x-1)(x+1)$$

5.   (a) Factorise fully $10ab - 24a^2$

$$2a(5b - 12a)$$

(b) Factorise $p^2 + 10p - 24$

$= (p+12)(p-2)$

$p \quad + \quad 12$

$p \quad - \quad 2$

6. (a) Factorise completely $6xy - 3x$

$3x(2y - 1)$

(b) Factorise completely $6ab - 2bc + 3ad - cd$

$2b(3a - c) + d(3a - c)$

$(2b + d)(3a - c)$

7. Factorise fully $8xy^2 - 18xy$

$2xy(4y - 9)$

8. Factorise fully $6p^3q^5r - 15pq^3$

$3pq^3 (2p^2q^2r - 5)$

9. Factorise $15n^2 - 11n - 14$

$(5n - 7)(3n + 2)$

$5 \quad - \quad 7$

$3 \quad + \quad 2$
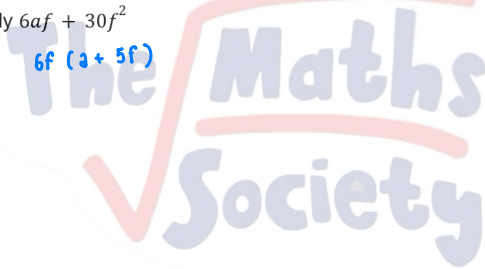
10. Factorise completely $2mc^2 + 6p^2c^4$

$2c^2 (m + 3p^2c^2)$

11. Factorise completely $12xy - 15y$

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

12. . Factorise fully $6af + 30f^2$

$$6f(a + 5f)$$

13. Factorise fully $6x^3 + 31x^2 + 53x + 30$

$$(x+2)$$

$$f(-2) = 6(-2)^3 + 31(-2)^2 + 53(-2) + 30$$

$$= -48 + 124 - 106 + 30$$

$$= 0$$

$\therefore (x+2)$ is a factor.

$$(x+2)(6x^2 + 19x + 15)$$
$$= (x+2)(2x+3)(3x+5)$$

$$\begin{array}{r} 6x^2 + 19x + 15 \\ x+2 \overline{\smash{\big)}\ 6x^3 + 31x^2 + 53x + 30} \\ \underline{6x^2 + 12x^2} \\ 19x^2 + 53x \\ \underline{19x^2 + 38x} \\ 15x + 30 \\ \underline{15x + 30} \\ 0 \end{array}$$

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