



SPTA

Unit Revision

Expressions & Formulae



Answers

1. Simplify, giving your answer in surd form:

- | | | | | |
|----------------|------------------|------------------|-----------------|-----------------|
| a) $2\sqrt{3}$ | (b) $3\sqrt{3}$ | (c) $4\sqrt{2}$ | (d) $5\sqrt{3}$ | (e) $2\sqrt{5}$ |
| f) $3\sqrt{5}$ | (g) $2\sqrt{11}$ | (h) $10\sqrt{3}$ | (i) $5\sqrt{5}$ | (j) $6\sqrt{2}$ |

2. Simplify the following:

- | | | | | |
|-----------|-------------|--------------|----------------|------------|
| a) y^7 | (b) $12m^5$ | (c) g^4 | (d) h^6 | (e) x^3 |
| f) $3x^3$ | (g) h^2 | (h) y^{-1} | (i) $8m^{5/2}$ | (j) $8m^9$ |

3. a) 1.55×10^8 (b) $\text{£}2.8 \times 10^6$ (c) $1.8414 \times 10^{-2} \text{ kg}$

4. a) $5x + 20$	(b) $8x - 12y$	(c) $3a^2 + ab$	(d) $5m^2 - 6m$
e) $2y^2 - 6y$	(f) $2y^2 + xy$	(g) $x^2 + 8x + 15$	(h) $m^2 + m - 12$
i) $h^2 - 8h + 15$	(j) $x^2 + x - 20$	(k) $x^2 + 12x + 36$	(l) $x^2 - 10x + 25$

5. a) $x^2 + 12x + 36$

b) Right rectangle = $x^2 + 12x + 27$ Left rectangle = $x^2 + 4x - 5$ Total = $2x^2 + 16x + 22$

c) Outer rectangle = $x^2 + 11x + 24$ Inner rectangle = 12 Total = $x^2 + 11x + 12$

6. (a) $2(x + 3)$ (b) $7(2y - 1)$ (c) $2(2a + 3b)$
 (d) $5(2x - 5y)$ (e) $y(y + 7)$ (f) $a(a - 3)$
 (g) $d(3d + 5)$ (h) $3m(2m - 1)$ (i) $(x + 4)(x - 4)$
 (j) $(y + 5)(y - 5)$ (k) $(a + 10)(a - 10)$ (l) $(p + 1)(p - 1)$
 (m) $(x + 5)(x + 1)$ (n) $(y + 3)(y + 2)$ (o) $(h + 5)(h + 3)$
 (p) $(x + 6)(x + 2)$

7. (a) $(x + 3)^2 - 5$ (b) $(x + 4)^2 - 15$ (c) $(x + 4)^2 - 26$
 (d) $(x + 2)^2 - 3$ (e) $(x + 5)^2 - 33$ (f) $(x + 1)^2 - 4$

8. a) $x + 4$ (b) $\frac{1}{(x-5)}$ (c) $x - 6$
 d) $\frac{x+6}{x-7}$ (e) $\frac{3x+5}{2x+1}$ (f) $\frac{2x+1}{4x-7}$

9. a) $\frac{49}{40}$ (b) $\frac{6y+3x}{xy}$ (c) $\frac{3a+4b}{ab}$ (d) $\frac{8y-3x}{xy}$
 e) $\frac{2n-3m}{mn}$ (f) $\frac{15}{28}$ (g) $\frac{4}{7}$ (h) $\frac{12}{xy}$
 i) $\frac{4b}{ac}$ (j) $\frac{5}{4}$ (k) $\frac{bc}{4d}$ (l) $\frac{xz}{5y}$

10. a) 0.5 (b) 2 (c) CD

11. a) 1 (b) 0.2 (c) EF

12. a) -2.4 (b) -1.33

13. a) 504.61 cm^3 (b) 417.49 inches^3 (c) 16201.95 cm^3

14. Volume of tank = 2923.92 cm^3 Volume of tub = 2815.64 cm^3

As the tub has a smaller volume than the tank it will overflow.

15. Volume of Sphere = 2.14 cm^3

Volume of cone = 50.82 cm^3

Number of ball bearings = $50.82 \div 2.14 = 23.75 = 24$

16. a) 7.85 cm

(b) 12.56 cm

(c) 8.79 cm

17. a) 19.63 cm^2

(b) 37.68 cm^2

(c) 30.77 cm^2

18. 25.10 cm^2

19. 2.61 m

20. a) 2041 cm^2

(b) 136.07 cm

(c) 18 cones

21. 663 hats