

16. a) m^2 b) $\frac{1}{x^4}$
- c) $-\frac{3b^2}{a^6}$ d) $-\frac{4c^2b^6}{a^3}$
17. a) $\frac{x^2}{y^4}$ b) $\frac{b}{25a^4}$
19. a) $\frac{m^8}{n^2}$ b) $\frac{r^2}{s^4}$
20. a) i) Dimensions, in millimetres: $\frac{1000}{2^4}$ by $\frac{1000}{2^4}$;
297 mm by 420 mm
- ii) Dimensions, in millimetres: $\frac{1000}{2^4}$ by $\frac{1000}{2^4}$;
210 mm by 297 mm
- iii) Dimensions, in millimetres: $\frac{1000}{2^4}$ by $\frac{1000}{2^4}$;
149 mm by 210 mm
- b) i) Dimensions, in millimetres: $\frac{1000}{2^4}$ by $\frac{1000}{2^4}$
- ii) Dimensions, in millimetres: $\frac{1000}{2^4}$ by $\frac{1000}{2^4}$
- iii) Dimensions, in millimetres: $\frac{1000}{2^4}$ by $\frac{1000}{2^4}$
- c) A piece of A4 paper has the same dimensions as a folded piece of A3 paper; a piece of A5 paper has the same dimensions as a folded piece of A4 paper.
21. a) $\frac{a^{16}c^3}{b^7}$ b) $\frac{c^{14}}{64a^2b^{10}}$
22. a) $\frac{1}{a^9}$ b) $\frac{1}{a^2}$
23. For example:
- a) $x^1 \cdot x^2, x^3 \cdot x^4, x^2 \cdot x^{-1}$
- b) $x^2 \div x^{\frac{1}{2}}, x^{\frac{5}{2}} \div x^1, x^{-1} \div x^{-\frac{5}{2}}$
- c) $\left(x^{\frac{1}{2}}\right)^3, \left(x^6\right)^{\frac{1}{4}}, \left(x^{-\frac{1}{3}}\right)^{-\frac{9}{2}}$
24. $\frac{1}{2}\left(\frac{3}{2}\right)^{\frac{1}{2}}$ cm, or approximately 0.6 cm

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1. a) 10 b) 0.9
- c) 2 d) $\frac{3}{5}$
2. The index tells which root to take.
3. a) 3.3 b) -2.3
- c) 2.0
4. a) 25 b) 216
- c) 2401
5. Neither
6. a) Rational b) Rational
- c) Rational d) Irrational
- e) Rational f) Rational
- g) Rational h) Irrational
- i) Irrational
7. Approximately 4.8 cm
8. a) Rational b) Irrational
9. $\sqrt[3]{-30}, \sqrt[4]{10}, \sqrt[4]{18}, \sqrt[3]{30}, \sqrt{20}, \sqrt{30}$
-
10. 1 s
11. a) $5\sqrt{6}$ b) $3\sqrt[3]{5}$
- c) $4\sqrt{7}$ d) $3\sqrt[4]{2}$
12. a) $\sqrt{180}$ b) $\sqrt{126}$
- c) $\sqrt[3]{192}$ d) $\sqrt[4]{32}$
13. Approximately 1.0 cm
15. $6\sqrt{2}, 3\sqrt{6}, 5\sqrt{2}, 4\sqrt{3}, 2\sqrt{7}$
17. a) $\sqrt[4]{12}$ b) $\sqrt[3]{(-50)^5}$, or $(\sqrt[3]{-50})^5$
- c) $\sqrt{1.2}$ d) $\sqrt[3]{\frac{3}{8}}$
18. a) $1.4^{\frac{1}{2}}$ b) $13^{\frac{2}{3}}$
- c) $2.5^{\frac{4}{5}}$ d) $\left(\frac{2}{5}\right)^{\frac{3}{4}}$
19. a) 2 b) 1.2
- c) -32 d) $\frac{27}{64}$
20. Approximately 35%
21. $(\sqrt{5})^3, 5^{\frac{3}{4}}, 5^{\frac{2}{3}}, \sqrt[3]{5}, \sqrt[4]{5}$

22. a) Approximately 7122 Calories/day
 b) Approximately 4 Calories/day
23. a) The numbers at the left are divided by 3 each time; the exponents in the powers at the right decrease by 1 each time.

b) $3 = 3^1$; $1 = 3^0$; $\frac{1}{3} = 3^{-1}$; $\frac{1}{9} = 3^{-2}$; $\frac{1}{27} = 3^{-3}$

24. a) $\frac{1}{4}$ b) $\frac{27}{8}$

c) $\frac{125}{8}$

25. \$908.51

26. 18.0 cm

27. 262 Hz

28. a) $9m^8n^2$ b) $\frac{1}{x^4y^6}$

c) $\frac{1}{4ab^3}$ d) $\frac{1}{r^{\frac{10}{3}}s^{\frac{2}{3}}}$

29. a) a^2b^5 b) $\frac{x^2}{y}$

c) $\frac{1}{a^5}$ d) $x^{\frac{3}{2}}y^3$

30. a) $\frac{9}{4}$ b) 30.25

c) $\frac{144}{25}$ d) 0.4

31. Approximately 6.4 cm

32. a) $s^3t^{\frac{10}{3}}$

b) $\frac{d^9}{64c}$

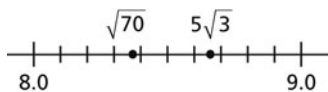
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1. B

2. A

3. a) $5\sqrt{3}$; $5\sqrt{3} = \sqrt{75}$

b)



4. a) $\frac{4}{3}$ b) $\frac{1}{16}$

c) 0.729 d) $\frac{1}{4}$

5. $2\sqrt{11}$

6. $\frac{y^5}{x^2}$

7. a) $\frac{1}{p^2q}$ b) $\frac{1}{cd^{\frac{1}{3}}}$

8. Approximately 29 L

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1. 117 m²

2. 236 in.³

3. a) 5.2 cm b) 1 in.

4. 28 ft.

5. 64.2°

6. a) $9\frac{7}{10}$ in. b) 4 in.²

7. a) 9; 585

b) 14; 924

c) 3; 3150

d) 2; 4620

8. 8214 in.²

9. a) 1, 4, 9, 16, 25, 36, 49, 64, 81, 100

b) 1, 8, 27, 64, 125, 216, 343, 512, 729, 1000

c) 1, 64, 729

10. a) $3a(5a - 9)$ b) $2p(2 + 6p^2 - 3p)$

c) $-2d(4d^3 + 7)$ d) $7(3w - 4 + 2w^2)$

e) $2x^2y^2(9x^2 - 2xy + 5y^2)$ f) $11np^2(3n^3p + n - 11p^2)$

11. The trinomials that can be represented as a rectangle of algebra tiles can be factored.

a) Can be represented b) Cannot be represented

c) Cannot be represented d) Can be represented

12. a) $d^2 + 2d - 15$

	d	-3
d	$(d)(d) = d^2$	$(d)(-3) = -3d$
5	$(5)(d) = 5d$	$(5)(-3) = -15$

b) $45 - 14s + s^2$

	9	$-s$
5	$(5)(9) = 45$	$(5)(-s) = -5s$
$-s$	$(-s)(9) = -9s$	$(-s)(-s) = s^2$