

GCSE Maths: Squares, cubes, roots and powers (Higher): answers

GCSE Maths - Factors, Multiples and Primes - Higher - Lesson 2.6

Answers. Final answers to the worksheet questions. Full step-by-step solutions for every question are free at websink.site/gcse/maths/ch02-factors-multiples-primes-powers/higher/squares-cubes-roots-and-powers/

Exercise 2F Squares, cubes and roots Non-calculator

1 Work out each square. Do not use a calculator.

(a) 4^2

Answer: 16

(b) 7^2

Answer: 49

(c) 9^2

Answer: 81

(d) 11^2

Answer: 121

(e) 12^2

Answer: 144

(f) 15^2

Answer: 225

2 Work out each cube.

(a) 2^3

Answer: 8

(b) 3^3

Answer: 27

(c) 4^3

Answer: 64

(d) 5^3

Answer: 125

(e) 10^3

Answer: 1000

(f) 7^3

Answer: 343

3 Work out each square root.

(a) $\sqrt{25}$

Answer: 5

(b) $\sqrt{64}$

Answer: 8

(c) $\sqrt{81}$

Answer: 9

(d) $\sqrt{121}$

Answer: 11

(e) $\sqrt{144}$

Answer: 12

(f) $\sqrt{196}$

Answer: 14

4 Work out each cube root.

(a) cube root of 8

Answer: 2

(b) cube root of 27

Answer: 3

(c) cube root of 64

Answer: 4

(d) cube root of 125

Answer: 5

(e) cube root of 1000

Answer: 10

(f) cube root of 343

Answer: 7

5 Work out the value of each power.

(a) 2^5

Answer: 32

(b) 3^4

Answer: 81

(c) 5^3

Answer: 125

(d) 4^4

Answer: 256

(e) 2^8

Answer: 256

(f) 10^5

Answer: 100,000

6 Write each number as a power of the base given.

(a) 32 as a power of 2

Answer: 2^5

(b) 81 as a power of 3

Answer: 3^4

(c) 125 as a power of 5

Answer: 5^3

(d) 256 as a power of 4

Answer: 4^4

(e) 729 as a power of 3

Answer: 3^6

(f) 1024 as a power of 2

Answer: 2^{10}

7 Work out each of these. Remember BIDMAS.

(a) $7 + 3^2$

Answer: 16

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

Answer: 49

(c) 5×4^2

Answer: 80

(d) $4^3 - 6^2$

Answer: 28

(e) $\sqrt{49} + 2^3$

Answer: 15

(f) $\sqrt{8^2 + 15^2}$

Answer: 17

8 Work out each of these.

(a) $(-4)^2$

Answer: 16

(b) -4^2

Answer: -16

(c) $(-5)^2$

Answer: 25

(d) -5^2

Answer: -25

9 Work out each of these. Do not use a calculator.

(a) 0.3^2

Answer: 0.09

(b) 0.5^2

Answer: 0.25

(c) 1.2^2

Answer: 1.44

(d) 0.2^3

Answer: 0.008

(e) 1.5^2

Answer: 2.25

(f) 1.1^2

Answer: 1.21

10 A square patio has an area of 169 m^2 . Work out the length of one side of the patio.

Answer: 13 m

11 A solid cube has a volume of 125 cm^3 .

(a) Work out the length of one edge.

Answer: 5 cm

- (b) Work out the total surface area of the cube.

Answer: 150 cm^2

- 12 Which is bigger? Work out both values to find out.

- (a) 2^8 or 8^2

Answer: $2^8 > 8^2$ (256 and 64)

- (b) 3^4 or 4^3

Answer: $3^4 > 4^3$ (81 and 64)

- (c) 5^3 or 3^5

Answer: $5^3 < 3^5$ (125 and 243)

- 13 Is each number a square number? Give a reason.

- (a) 50

Answer: No

- (b) 121

Answer: Yes

- (c) 200

Answer: No

- (d) 1000

Answer: No

- 14 (a) Work out $\sqrt{49}$. (b) Solve $x^2 = 49$. (c) Explain why your answers to (a) and (b) are different.

- (a) (a)

Answer: 7

- (b) (b)

Answer: $x = 7$ or $x = -7$

- (c) (c)

Answer: The $\sqrt{}$ sign means the positive square root only. The equation $x^2 = 49$ asks for every number whose square is 49, which is 7 and -7 .

- 15 Work out each of these. Give your answer as a fraction.

- (a) $(\frac{2}{3})^2$

Answer: $\frac{4}{9}$

- (b) $(\frac{3}{4})^3$

Answer: $\frac{27}{64}$

(c) $(\frac{5}{6})^2$

Answer: $\frac{25}{36}$

(d) $(\frac{1}{2})^4$

Answer: $\frac{1}{16}$

16 Prove that the square of an odd number is always odd.

Answer: $(2k + 1)^2 = 2(2k^2 + 2k) + 1$, which is odd

17 Two different square numbers, both more than 0, add up to 100. Find the two square numbers.

Answer: 36 and 64