

GCSE Maths: Roots and fractional indices (Foundation): worksheet

GCSE Maths - Standard Form, Indices and Surds - Foundation - Lesson 6.3

Name: _____

Date: _____

Score: _____

22 questions. Write your answers in the spaces. Answers and step-by-step help are free at websink.site/gcse/maths/ch06-standard-form-indices-surds/foundation/roots-and-fractional-indices/

Exercise 6E Roots without a calculator

Non-calculator

1 Work out each square root.

(a) $\sqrt{36}$

Answer: _____

(b) $\sqrt{81}$

Answer: _____

(c) $\sqrt{121}$

Answer: _____

(d) $\sqrt{169}$

Answer: _____

(e) $\sqrt{400}$

Answer: _____

(f) $\sqrt{25}$

Answer: _____

2 Work out each cube root.

(a) $\sqrt[3]{8}$

Answer: _____

(b) $\sqrt[3]{27}$

Answer: _____

(c) $\sqrt[3]{64}$

Answer: _____

(d) $\sqrt[3]{125}$

Answer: _____

(e) $\sqrt[3]{1000}$

Answer: _____

(f) $\sqrt[3]{216}$

Answer: _____

3 Work out each square root.

(a) $\sqrt{\frac{9}{16}}$

Answer:

(b) $\sqrt{\frac{4}{25}}$

Answer:

(c) $\sqrt{\frac{1}{36}}$

Answer:

(d) $\sqrt{\frac{49}{64}}$

Answer:

4 Work out each root. Give your answer as a decimal.

(a) $\sqrt{0.25}$

Answer:

(b) $\sqrt{0.81}$

Answer:

(c) $\sqrt{0.0144}$

Answer:

(d) $\sqrt[3]{0.027}$

Answer:

(e) $\sqrt[3]{0.008}$

Answer:

5 Work out each calculation.

(a) $\sqrt{49} + \sqrt{81}$

Answer:

(b) $\sqrt[3]{64} - \sqrt{16}$

Answer:

(c) $5^2 - \sqrt[3]{125}$

Answer:

(d) $\sqrt{100} + 3^3 - \sqrt{4}$

Answer:

6 Between which two whole numbers does each root lie?

(a) $\sqrt{20}$

Answer:

(b) $\sqrt{70}$

Answer:

(c) $\sqrt[3]{30}$

Answer:

(d) ${}^3\sqrt{100}$

Answer:

(e) $\sqrt{200}$

Answer:

7 Solve each equation.

(a) $x^2 = 49$

Answer:

(b) $x^2 = 121$

Answer:

(c) $x^3 = 27$

Answer:

(d) $x^3 = 125$

Answer:

8 Work out each value.

(a) $(\sqrt{7})^2$

Answer:

(b) $(\sqrt{13})^2$

Answer:

(c) $(\sqrt{2})^2$

Answer:

(d) $(\sqrt{50})^2$

Answer:

- 9** A square patio has an area of 81 m^2 . Work out the length of one side, and the length of the fence needed to go all the way around the patio.

Answer:

- 10** A cube-shaped box has a volume of 216 cm^3 . Work out the total length of all 12 edges of the box.

Answer:

- 11** A square has an area of 150 cm^2 . Between which two whole numbers is the length of its side?

Answer:

- 12** Is $\sqrt{9 + 16}$ the same as $\sqrt{9} + \sqrt{16}$? Show your working.

Answer:

- 13** Show that $\sqrt{50}$ is greater than 7 but less than 7.1.

Answer:

- 14** Explain why $\sqrt{-9}$ cannot be worked out using real numbers.

Answer:

- 15** Find a number between 50 and 100 that is both a square number and a cube number.

Answer:

Exercise 6F Powers and roots with a calculator

Calculator allowed

1 Use a calculator to work out each root. Give your answers to 3 significant figures.

(a) $\sqrt{7}$

Answer:

(b) $\sqrt{130}$

Answer:

(c) $\sqrt{2000}$

Answer:

(d) $\sqrt[3]{50}$

Answer:

(e) $\sqrt[3]{300}$

Answer:

2 Use a calculator to work out each power. Give your answers to 3 significant figures.

(a) 2.5^4

Answer:

(b) 1.05^{10}

Answer:

(c) 3.2^{-2}

Answer:

(d) 0.9^5

Answer:

(e) 8^{-2}

Answer:

3 A square picture has an area of 90 cm^2 . Work out the length of one side to 1 decimal place.

Answer:

4 £1500 is invested. After 5 years it is worth $£1500 \times 1.04^5$. Work out its value, to the nearest penny.

Answer:

5 Work out $\sqrt{(5.2^2 + 3.9^2)}$.

Answer:

6 Use a calculator to work out each value. Give your answers to 3 significant figures.

(a) $\sqrt{11}$

Answer:

(b) $\sqrt{59}$

Answer:

(c) 1.5^6

Answer:

(d) 0.5^{-3}

Answer:

7 Show, using a calculator, that $\sqrt[3]{100}$ is between 4.6 and 4.7.

Answer:
