# Real numbers: 10 practice questions

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Name: _____ Date: _____

Attempt all questions and show your working. Suggested time: 15 to 20 minutes. Use the π key on your calculator unless a question says otherwise.

## Section A: Consolidating (Questions 1-4)

**Question 1**

Classify each number as rational or irrational.

(a) 0.75

(b) √(16)

(c) √7

(d) -⅜

(e) π

**Question 2**

Write each decimal as a fraction in simplest form.

(a) 0.35

(b) 2.4

(c) 0.125

**Question 3**

Between which two consecutive whole numbers does each square root lie?

(a) √(30)

(b) √(90)

**Question 4**

Write each fraction as a decimal. Use dot notation for any recurring decimal.

(a) ⅜

(b) ⅔

(c) 5/11

## Section B: Standard (Questions 5-10)

**Question 5**

Write each recurring decimal as a fraction in simplest form.

(a) 0.777…

(b) 0.111…888…

(c) 0.1666…

**Question 6**

Without dividing, decide whether each fraction gives a terminating decimal or a recurring decimal. Explain how you can tell.

(a) 7/20

(b) 5/12

(c) 9/40

(d) 4/15

**Question 7**

Use a calculator to help you write these numbers in order from smallest to largest.

$\sqrt{10}$, quad 3.1, quad $\pi$, quad 22/7, quad 3.111…

**Question 8**

Use a calculator to evaluate each expression, correct to 2 decimal places.

(a) $\sqrt{50}$

(b) $3\pi$

(c) $\sqrt{3} + \sqrt{5}$

(d) $(1 + \sqrt{5})/(2)$

**Question 9**

A square tile has sides of 6 cm. By Pythagoras' theorem, the length d of its diagonal satisfies $d^2 = 6^2 + 6^2$.

(a) Find the exact length of the diagonal.

(b) Find the length of the diagonal correct to 1 decimal place.

(c) Is the exact length of the diagonal a rational or an irrational number?

**Question 10**

A circle has a radius of 5 cm. The circumference of a circle is $C = 2\pi r$.

(a) Find the exact circumference, in terms of $\pi$.

(b) Find the circumference correct to 2 decimal places.

(c) Is the circumference a rational or an irrational number of centimetres? Give a reason.

# Real numbers: answers

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**Question 1**

Answer: (a) rational (b) rational (√(16) = 4) (c) irrational (d) rational (e) irrational

**Question 2**

Answer: (a) 7/20 (b) 12/5 (or 2⅖) (c) ⅛

**Question 3**

Answer: (a) 5 and 6 (25 < 30 < 36) (b) 9 and 10 (81 < 90 < 100)

**Question 4**

Answer: (a) 0.375 (b) 0.666… (c) 0.444…555…

**Question 5**

Answer: (a) 7/9 (b) 2/11 (18/99) (c) ⅙

**Question 6**

Answer: (a) terminating (b) recurring (c) terminating (d) recurring. Key point: in simplest form, a fraction terminates only if the denominator has no prime factors other than 2 and 5 (20 = $2^2 \times 5$, 40 = $2^3 \times 5$, but 12 has a factor of 3 and 15 has a factor of 3).

**Question 7**

Answer: 3.1, 3.111…, π, 22/7, √(10) (3.1, 3.111…, 3.1416…, 3.1429…, 3.1623…)

**Question 8**

Answer: (a) 7.07 (b) 9.42 (c) 3.97 (d) 1.62

**Question 9**

Answer: (a) √(72) cm (also accept 6√2 cm) (b) 8.5 cm (c) irrational

**Question 10**

Answer: (a) 10π cm (b) 31.42 cm (c) irrational, because 10π is a non-zero rational number (10) multiplied by π, which is irrational, so it cannot be written as a fraction.