

Name: _____

Exam Style Questions

Rational and Irrational Numbers



Ensure you have: Pencil, pen, ruler, protractor, pair of compasses and eraser

You may use tracing paper if needed

Guidance

1. Read each question carefully before you begin answering it.
2. Don't spend too long on one question.
3. Attempt every question.
4. Check your answers seem right.
5. Always show your workings

Revision for this topic

www.corbettmaths.com/contents

Video 230



1. Circle the rational numbers

π

$\sqrt{9}$

$0.1111\dots$

4

$\sqrt{2}$

$\frac{1}{3}$

(2)

-
2. x is an irrational number between 7 and 10.
Find a value for x .

$\sqrt{99}$
 $\sqrt{50}$
 3π

(1)

-
3. y is an irrational number between 3 and 4.
Find a value for y .

$\sqrt{12}$
 π

(1)

4. \sqrt{z} is a rational number between $\sqrt{105}$ and $\sqrt{135}$
Find a value for z .

$$\sqrt{121} = 11$$

$$\frac{121}{(1)}$$

5. Which of these equations has a rational solution?

Equation 1

$$\frac{2}{3}x^2 = 26$$

Explain your answer.

Eqn 1
 $2x^2 = 78$
 $x^2 = 39$
 irrational

Equation 2

$$\frac{5}{6}x^2 = 120$$

Eqn 2
 $5x^2 = 720$
 $x^2 = 144$
 ✓
rational

Equation 3

$$\frac{2}{7}x^2 = 100$$

$2x^2 = 700$
 $x^2 = 350$
 irrational

(2)

6.

$$5x^2 = k$$

The equation above can have rational or irrational solutions.

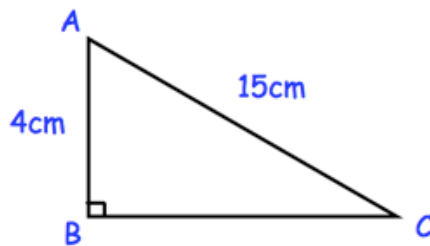
(a) Write down a value for k which gives rational solutions.

Answers include 5, 20 etc
(1)

(b) Write down a value for k which gives irrational solutions.

8
(1)

7. Shown below is right angled triangle ABC.



Is length of BC rational or irrational?

Show your working.

$$\begin{aligned}4^2 + BC^2 &= 15^2 \\16 + BC^2 &= 225 \\BC^2 &= 209\end{aligned}$$

irrational
(3)

8. Show $(5 - \sqrt{2})(5 + \sqrt{2})$ is rational

$$\begin{aligned} 25 + 5\sqrt{2} - 5\sqrt{2} - 2 \\ = 23 \quad \text{QED} \end{aligned}$$

(3)

9. Show $\frac{7\sqrt{12}}{2\sqrt{3}}$ is rational

$$\frac{7\sqrt{12}}{2\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}}$$

$$\frac{7\sqrt{36}}{2 \times 3} = \frac{7 \times 6}{6} = 7$$

(2)

10. Find two surds are multiplied together and give a rational number.

$$\sqrt{3} \times \sqrt{27}$$

$$\sqrt{2} \times \sqrt{32}$$

$$\sqrt{3} \times \sqrt{12}$$

.....
(1)