

6.2 Solutions

GCSE Mathematics The Classification of Numbers

Answer 1

$$n \in \{-2, -1, 0, 1, 2\}$$

[2 marks]

Answer 2

$\sqrt{29}$ cm (one mark lost if written as a decimal approximation, 5.385164807...)

[3 marks]

Answer 3

(i) 9π

[3 marks]

(ii) 28.3 cm^2

[1 mark]

Answer 4

(i) $\mathbb{Q}$ rational (ii) $\mathbb{P}$ irrational (iii) $\mathbb{Q}$ rational

[3 marks]

Answer 5

(i) $\frac{49}{64}$ (ii) $\frac{18}{19}$ (iii) $\frac{5}{2}$

[1, 1, 2 marks]

Answer 6

For example, 2.5

[2 marks]

Answer 7

(i) $\mathbb{P}$ irrational (ii) $\mathbb{Q}$ rational (iii) $\mathbb{Q}$ rational
(iv) $\mathbb{Q}$ rational (v) $\mathbb{P}$ irrational (vi) $\mathbb{P}$ irrational

[6 marks]

Answer 8

(i) 15 cm (ii) $\mathbb{Q}$ rational

[2, 1 marks]

Answer 9

$$0.875 = \frac{875}{1000} = \frac{7}{8}$$

[3 marks]

Answer 10

$\pi \neq 3.14$ although 3.14 is a good rational approximation to π

[2 marks]

Answer 11

$$n \in \{ 3, 4, 5, 6 \}$$

[3 marks]**Answer 12**

$$\text{Let } x = 0.181\,818\,181\,818\, \dots$$

$$\begin{array}{r} 100x = 18.181\,818\,181\,818\,181\, \dots \\ \text{SUBTRACT } x = 0.181\,818\,181\,818\,181\, \dots \\ \hline \end{array}$$

$$99x = 18$$

$$x = \frac{18}{99}$$

$$x = \frac{2}{11}$$

[3 marks]**Answer 13**

$$(i) \quad \frac{9}{16}$$

$$(ii) \quad \frac{4}{5}$$

[2, 2 marks]**Answer 14**

$$\begin{aligned} \sqrt{\left(\frac{12}{5}\right)^2 + \left(\frac{16}{5}\right)^2} &= \sqrt{\frac{144}{25} + \frac{256}{25}} \\ &= \sqrt{\frac{400}{25}} \\ &= \sqrt{16} \\ &= 4 \quad \text{which is an integer} \quad \square \end{aligned}$$

[3 marks]**Answer 15**

$$(i) \quad 10\,000x = 2083.333\,333\,333\,33\dots$$

$$(ii) \quad 1\,000x = 208.333\,333\,333\,33\dots$$

$$(iii) \quad 9\,000x = 1875$$

$$(iv) \quad x = \frac{5}{24}$$

[1, 1, 1, 2 marks]