

5.2 Solutions

GCSE Mathematics The Classification of Numbers

Answer 1

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

[2 marks]

Answer 2

$\sqrt{13}$ one mark lost if written as a decimal approximation, 3.605551275...

[3 marks]

Answer 3

(i) 144π

[3 marks]

(ii) 452.4

[1 mark]

Answer 4

(i) $\mathbb{Q}$ rational

(ii) $\mathbb{P}$ irrational

(iii) $\mathbb{Q}$ rational

[3 marks]

Answer 5

(i) $\frac{49}{81}$

(ii) $\frac{10}{17}$

(iii) $\frac{169}{16}$

[1, 1, 2 marks]

Answer 6

For example, 2.3

[2 marks]

Answer 7

(i) $\mathbb{Q}$ rational

(ii) $\mathbb{P}$ irrational

(iii) $\mathbb{Q}$ rational

(iv) $\mathbb{Q}$ rational

(v) $\mathbb{P}$ irrational

(vi) $\mathbb{Q}$ rational

[6 marks]

Answer 8

(i) 7 cm

(ii) $\mathbb{Q}$ rational

[2, 1 marks]

Answer 9

$$0.625 = \frac{625}{1000} = \frac{5}{8}$$

[3 marks]

Answer 10

$\pi \neq \frac{22}{7}$ although $\frac{22}{7}$ is a well known, good, rational approximation to π

[2 marks]

Answer 11

$$n \in \{ 5, 6, 7 \}$$

[3 marks]**Answer 12**

$$\text{Let } x = 0.454\,545\,454\,545\,454\, \dots$$

$$\begin{array}{r} 100x = 45.454\,545\,454\,545\, \dots \\ \text{SUBTRACT } x = 0.454\,545\,454\,545\, \dots \\ \hline \end{array}$$

$$99x = 45$$

$$x = \frac{45}{99}$$

$$x = \frac{5}{11}$$

[3 marks]**Answer 13**

$$\text{(i) } \quad \frac{25}{36}$$

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

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

$$\begin{aligned} \sqrt{\left(\frac{6}{5}\right)^2 + \left(\frac{8}{5}\right)^2} &= \sqrt{\frac{36}{25} + \frac{64}{25}} \\ &= \sqrt{\frac{100}{25}} \\ &= \sqrt{4} \\ &= 2 \quad \text{which is an integer} \quad \square \end{aligned}$$

[3 marks]**Answer 15**

$$\text{(i) } \quad 10\,000x = 416.666\,666\,666\,66\ldots$$

$$\text{(ii) } \quad 1\,000x = 41.666\,666\,666\,66\ldots$$

$$\text{(iii) } \quad 9\,000x = 375$$

$$\text{(iv) } \quad x = \frac{1}{24}$$

[1, 1, 1, 2 marks]