Worked answers | Real numbers

Rational and irrational numbers

6 questions | 14 marks

Equivalent correct methods earn the corresponding marks.

1. Classify -6 and support your answer with a fraction. [2 marks]

$-6 = -6/1$.

Answer: Rational.

2. Classify 0.375 and write it as a simplified fraction. [2 marks]

$0.375 = 375/1000 = 3/8$.

Answer: Rational; $3/8$.

3. Classify $\sqrt{121}$ and explain. [2 marks]

$121 = 11^2$.

Answer: Rational; 11.

4. Classify $\sqrt{13}$ and explain. [2 marks]

13 is a positive integer that is not a perfect square.

Answer: Irrational.

5. Write $0.\overline{27}$ as a simplified fraction. [3 marks]

$100x - x = 27$, so $x = 27/99 = 3/11$.

Answer: $3/11$.

6. A student says 3.142 is irrational because it is close to π. Explain the error. [3 marks]

The decimal ends, so $3.142 = 3142/1000 = 1571/500$.

An approximation to an irrational value need not be irrational.

Answer: $3.142 = 1571/500$ is rational.