



Irrational numbers

Mana Maths

Te reo Māori terms



tauwehe
whakahau

rational number

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tau kewha

irrational number

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pae

pi

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pūtakerua

square root

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Foundation

1. Is $\sqrt{4}$ rational or irrational?
2. Is $\sqrt{9}$ rational or irrational?
3. Is $\sqrt{2}$ rational or irrational?
4. Is π rational or irrational?
5. Is 0.5 rational or irrational?
6. Is 0.25 rational or irrational?
7. Is $\frac{3}{4}$ rational or irrational?
8. Is 7 rational or irrational?
9. Is $\sqrt{16}$ rational or irrational?
10. Is $\sqrt{5}$ rational or irrational?
11. Is 2.75 rational or irrational?
12. Is $\sqrt{1}$ rational or irrational?
13. Circle the irrational number: 3, $\sqrt{3}$, $\frac{1}{2}$.
14. Circle the rational number: π , $\sqrt{7}$, 0.8.
15. Which is closer to 3: $\sqrt{10}$ or $\sqrt{8}$?

16. Complete: an irrational number cannot be written exactly as a fraction. True or false?

Proficient

1. Classify $\sqrt{25}$ as rational or irrational.
2. Classify $\sqrt{11}$ as rational or irrational.
3. Classify $-\sqrt{3}$ as rational or irrational.
4. Classify $\frac{22}{7}$ as rational or irrational.
5. Classify $0.333\dots$ as rational or irrational.
6. Classify $1.414213\dots$ as rational or irrational.
7. Which is irrational: $\sqrt{36}$ or $\sqrt{6}$?
8. Which is rational: π or $\frac{7}{5}$?
9. $\sqrt{12}$ is between which two whole numbers?
10. $\sqrt{20}$ is between which two whole numbers?
11. As written, is 3.14159 rational or irrational?
12. True or false: every terminating decimal is rational.

- 13.** True or false: every square root is irrational.
- 14.** Complete: $\sqrt{49} = \square$, so it is _____.
- 15.** Complete: $\sqrt{15}$ lies between \square and \square .
- 16.** Which is greater: $\sqrt{8}$ or 2.8?
- 17.** Which does not belong: $\sqrt{2}$, π , 0.6, $\sqrt{7}$?
- 18.** Why is $\sqrt{10}$ irrational? Give one short reason.

Excellence

1. A student says $\sqrt{81}$ is irrational because it has a root sign. Correct? Explain.
2. A student says $0.272727\dots$ is irrational because it goes on forever. Correct? Explain.
3. A student says $\pi = \frac{22}{7}$. Correct? Explain.
4. Which is greater: $\sqrt{18}$ or 4.3 ? Show enough working.
5. Which is smaller: $\sqrt{50}$ or 7.1 ? Explain.
6. Put in ascending order: 3 , $\sqrt{10}$, π , $\sqrt{11}$.
7. Put in descending order: $\sqrt{5}$, 2.3 , $\frac{9}{4}$, $\sqrt{6}$.
8. $\sqrt{30}$ lies between which consecutive integers?
9. $\sqrt{70}$ lies between which consecutive integers?

- 10.** Complete: an irrational number is _____ a terminating decimal.
- 11.** Complete: $\sqrt{\square}$ is rational when the number inside is a perfect square.
- 12.** Which does not belong: $\sqrt{9}$, $\sqrt{16}$, $\sqrt{18}$, $\sqrt{25}$?
- 13.** Which does not belong: 0.125, $\frac{1}{8}$, $\sqrt{2}$, 2.5?
- 14.** Is 2π rational or irrational? Give a short reason.
- 15.** Is $\sqrt{3} + 1$ rational or irrational? Give a short reason.
- 16.** A square has area 12 cm^2 . Its side length is $\sqrt{12}$ cm. Between which two whole cm does it lie?
- 17.** A circle has diameter 1 m. Is circumference π m rational or irrational?
- 18.** Why is 1.414 rational even though it approximates an irrational number?