THIRD SPACE LEARNING

Irrational Numbers Worksheet

Number and Quantity

Grades 6 to 8

Questions

Name: .....

Date: .....

For questions 1–10 decide whether each number is rational or irrational. Explain.

1 $\sqrt{17}$

Answer

2 $\sqrt{81}$

Answer

3 $\sqrt[3]{27}$

Answer

4 $\sqrt{48}$

Answer

5 $\sqrt[3]{64}$

Answer

6 $\sqrt{1.44}$

Answer

7 $\sqrt{2.5}$

Answer

8 $\sqrt{121}$

Answer

9 $\sqrt{77}$

Answer

10 $\sqrt{0.0004}$

Answer

For questions 11–15 decide which two whole numbers the square root is between. Explain.

11 $\sqrt{5}$

Answer

12 $\sqrt{10}$

Answer

13 $\sqrt{45}$

Answer

14 $\sqrt{88}$

Answer

15 $\sqrt{178}$

Answer

For questions 16-20 estimate the value to the nearest one decimal place.

16 $\sqrt{24}$

Answer

17 $\sqrt{75}$

Answer

18 $\sqrt{120}$

Answer

19 $\sqrt{50}$

Answer

20 $\sqrt{200}$

Answer

Answers

Question number	Question	Answers	Standard
1	$\sqrt{17}$	$\sqrt{17}$ is irrational because 17 is not a perfect square, and its square root cannot be expressed as a fraction.	8.NS.A.1
2	$\sqrt{81}$	$\sqrt{81}$ is rational because 81 is a perfect square, and its square root is 9, a whole number.	8.NS.A.1
3	$\sqrt[3]{27}$	$\sqrt[3]{27}$ is rational because 27 is a perfect cube, and its cube root is 3.	8.NS.A.1
4	$\sqrt{48}$	$\sqrt{48}$ is irrational because 48 is not a perfect square, and its square root cannot be expressed as a fraction.	8.NS.A.1
5	$\sqrt[3]{64}$	$\sqrt[3]{64}$ is rational because 64 is a perfect cube, and its cube root is 4.	8.NS.A.1
6	$\sqrt{1.44}$	$\sqrt{1.44}$ is rational because 1.44 is a perfect square, and its square root is 1.2.	8.NS.A.1

Question number	Question	Answers	Standard
7	$\sqrt{2.5}$	$\sqrt{2.5}$ is irrational because 2.5 is not a perfect square, and its square root cannot be expressed as a fraction.	8.NS.A.1
8	$\sqrt{121}$	$\sqrt{121}$ is rational because 121 is a perfect square, and its square root is 11.	8.NS.A.1
9	$\sqrt{77}$	$\sqrt{77}$ is irrational because 77 is not a perfect square, and its square root cannot be expressed as a fraction.	8.NS.A.1
10	$\sqrt{0.0004}$	$\sqrt{0.0004}$ is rational because $\sqrt{0.0004}$ = 0.02, which can be expressed as a fraction $\frac{2}{100}$.	8.NS.A.1
11	$\sqrt{5}$	$\sqrt{4}$ = 2 and $\sqrt{9}$ = 3, so $\sqrt{5}$ is between 2 and 3	8.NS.A.1
12	$\sqrt{10}$	$\sqrt{9}$ = 3 and $\sqrt{16}$ = 4, so $\sqrt{10}$ is between 3 and 4	8.NS.A.1
13	$\sqrt{45}$	$\sqrt{36}$ = 6 and $\sqrt{49}$ = 7, so $\sqrt{45}$ is between 6 and 7	8.NS.A.1
14	$\sqrt{88}$	$\sqrt{81}$ = 9 and $\sqrt{100}$=10, so $\sqrt{88}$ is between 9 and 10	8.NS.A.1

Question number	Question	Answers	Standard
15	$\sqrt{178}$	$\sqrt{169}$ = 13 and $\sqrt{196}$ = 14, so $\sqrt{178}$ is between 13 and 14	8.NS.A.1
16	$\sqrt{24}$	$\sqrt{24} \approx 4.9$, because $\sqrt{24}$ is between $\sqrt{16} = 4$ and $\sqrt{25} = 5$.	8.NS.A.1
17	$\sqrt{75}$	$\sqrt{75} \approx 8.7$, because $\sqrt{75}$ is between $\sqrt{64} = 8$ and $\sqrt{81} = 9$.	8.NS.A.1
18	$\sqrt{120}$	$\sqrt{120} \approx 10.9$, because $\sqrt{120}$ is between $\sqrt{100} = 10$ and $\sqrt{121} = 11$.	8.NS.A.1
19	$\sqrt{50}$	$\sqrt{50} \approx 7.1$, because $\sqrt{50}$ is between $\sqrt{49} = 7$ and $\sqrt{64} = 8$.	8.NS.A.1
20	$\sqrt{200}$	$\sqrt{200} \approx 14.1$, because $\sqrt{200}$ is between $\sqrt{196} = 4$ and $\sqrt{225} = 15$.	8.NS.A.1

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