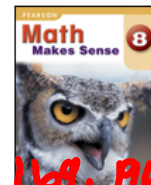


Warm Up Grade 8

Nov. 18, 2019



1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144, 169, 196, 225

1) Find the square root of each, (without a calculator)

a) 100

$$\sqrt{100} = 10$$

b) 176

$$\sqrt{176} = \sqrt{169} \cdot \sqrt{196} = 13 \cdot 14 = 182$$

(Note: The handwritten work shows a calculation that results in 182, which is incorrect for the square root of 176. The intended calculation was likely $\sqrt{176} \approx 13.3$.)

2) Prove that 86 is not perfect using factors.

86

$$1 \times 86$$

$$2 \times 43$$

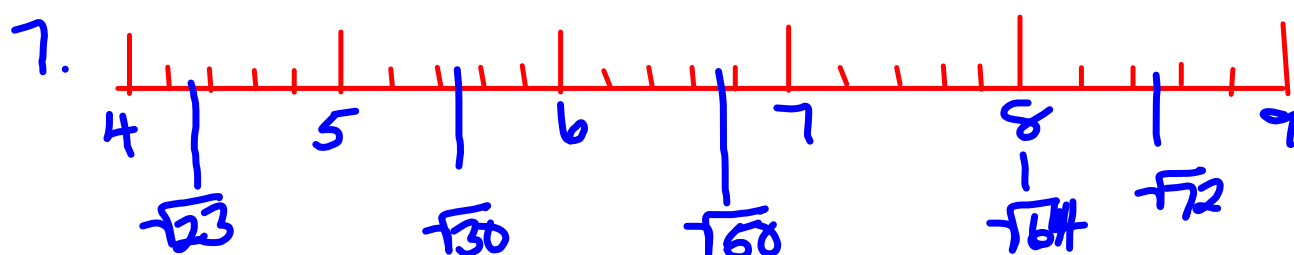
86 has 4 factors

↑
even # of factors
the 86 is not
a perfect square #

$$b. \sqrt{4} = 2 \quad \sqrt{9} = 3$$

$$\sqrt{7} \approx 2.7$$

Homework
Solutions



a) The estimates that are good are

$\sqrt{30}$ is in the middle between $\sqrt{25}$ and $\sqrt{36}$

$\sqrt{64}$ is exactly 8

$\sqrt{72}$ is in the middle between $\sqrt{64}$ and $\sqrt{81}$

b) $\sqrt{23}$ should be closer to 5 than 4
 $\sqrt{50}$ should be greater than 7

Homework
Solutions

a) $\sqrt{11}$
 $\sqrt{9}$ $\sqrt{16}$
 3 4
 $\sqrt{11} \approx 3.2$

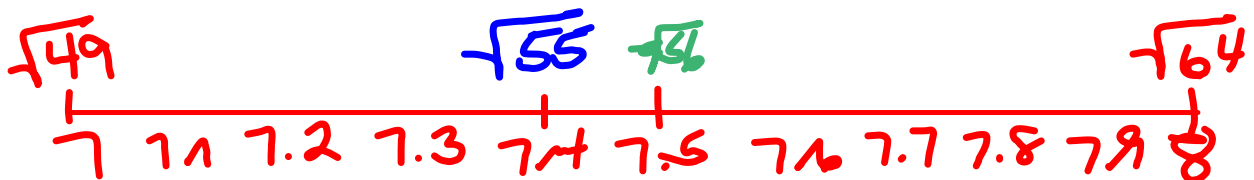
Perfect Squares	
1	4
9	16
25	36
49	64
81	100
121	144
169	196
225	

b) $\sqrt{40}$
 $\sqrt{36}$ $\sqrt{49}$
 6 7
 $\sqrt{40} \approx 6.3$

c) $\sqrt{30}$
 $\sqrt{25}$ $\sqrt{36}$
 5 6
 $\sqrt{30} \approx 5.5$

d) $\sqrt{55}$
 $\sqrt{49}$ $\sqrt{64}$
 7 8
 $\sqrt{55} \approx 7.4$

Middle between
49 and 64
 ≈ 56



Homework Solutions

9. $7, \sqrt{14}$

$$\sqrt{16} = 4, \text{ so } \sqrt{14} < 7$$

b) $8, \sqrt{60}$

$$8^2 = 64, \text{ so } \sqrt{60} < 8$$

c) $11, \sqrt{121}$

$$11^2 = 121, \text{ so } \sqrt{121} = 11$$

d) $12, \sqrt{150}$

$$\sqrt{144} = 12, \text{ so } \sqrt{150} > 12$$

10 a)

$$\begin{array}{cc} \sqrt{58} & \\ \sqrt{49} & \sqrt{64} \\ 7 & 8 \\ \sqrt{58} \approx 7.8 \end{array}$$

b)

$$\begin{array}{cc} \sqrt{70} & \\ \sqrt{64} & \sqrt{81} \\ 8 & 9 \\ \sqrt{70} \approx 8.3 \end{array}$$

c)

$$\begin{array}{cc} \sqrt{90} & \\ \sqrt{81} & \sqrt{100} \\ 9 & 10 \\ \sqrt{90} \approx 9.5 \end{array}$$

d)

$$\begin{array}{cc} \sqrt{151} & \\ \sqrt{144} & \sqrt{169} \\ 12 & 13 \\ \sqrt{151} \approx 12.2 \end{array}$$

Perfect Squares

1	4
9	16
25	36
49	64
81	100
121	144
169	196
225	

11. a) $\sqrt{17}$ is between 16 and 18

False,

$\sqrt{17}$ is between 4 ($\sqrt{16}$) and 5 ($\sqrt{25}$)

Homework

Solutions

b) $\sqrt{5} + \sqrt{5} = \sqrt{10}$

$$\sqrt{5} \approx 2.2$$

$$\sqrt{4} = 2$$

$$\sqrt{9} = 3$$

$$\sqrt{10} \approx 3.2$$

$$\sqrt{9} = 3$$

$$\sqrt{16} = 4$$

Is $2.2 + 2.2 = 3.2$, NO

so False $\sqrt{5} + \sqrt{5}$ does not equal $\sqrt{10}$

c) $\sqrt{13}$ is between 11 and 12

True

$$\sqrt{121} = 11 \quad \text{and} \quad \sqrt{144} = 12$$

and 13 is between 121 and 144

Mid-Unit Review

Page 30

#1 (Don't draw diagrams)

#2

#3

#5 a

#7

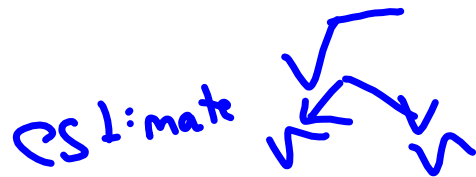
#9

#10

#11 Don't guess (estimate)

Study

$$\text{Area of Square} = \text{side}^2$$
$$\text{side} = \sqrt{\text{Area}}$$



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Homework

12 a) $\sqrt{23}$
 $\sqrt{16}$ $\sqrt{25}$
 4 5
 $\sqrt{23} \approx 4.8$

b) $\sqrt{13}$
 $\sqrt{9}$ $\sqrt{16}$
 3 4
 $\sqrt{13} \approx 3.5$

Solutions

c) $\sqrt{78}$
 $\sqrt{64}$ $\sqrt{81}$
 8 9
 $\sqrt{78} \approx 8.8$

d) $\sqrt{135}$
 $\sqrt{121}$ $\sqrt{144}$
 11 12
 $\sqrt{135} \approx 11.7$

e) $\sqrt{62}$
 $\sqrt{49}$ $\sqrt{64}$
 7 8
 $\sqrt{62} \approx 7.8$
 or 7.9

Perfect Squares	
1	4
9	16
25	36
49	64
81	100
121	144
169	196
225	

f) $\sqrt{45}$
 $\sqrt{36}$ $\sqrt{49}$
 6 7
 $\sqrt{45} \approx 6.7$

13. Area = 92 cm^2
 Side Length = $\sqrt{92}$
 $\sqrt{81}$ $\sqrt{100}$
 9 10
 $\sqrt{92} \approx 9.6$

b) Area = 430 m^2
 Side Length = $\sqrt{430}$
 $\sqrt{400}$ $\sqrt{441}$
 20 21
 $\sqrt{430} \approx 20.7$

$20^2 = 400$
 $21^2 = 441$

c) Area = 150 cm^2
 Side Length = $\sqrt{150}$
 $\sqrt{144}$ $\sqrt{169}$
 12 13
 $\sqrt{150} \approx 12.2$

d) Area = 29 m^2
 Side Length = $\sqrt{29}$
 $\sqrt{25}$ $\sqrt{36}$
 5 6
 $\sqrt{29} \approx 5.3$

Homework

Solutions

14a) $\sqrt{17}$ is about 8.50

Not a good estimate $\sqrt{16} = 4$, so
 $\sqrt{17}$ a little more than 4.

b) $\sqrt{20}$ is about 4.3

$$\sqrt{16} = 4, \sqrt{25} = 5$$

4.3 is an OK estimate, but 20 is
about the middle so 4.4 or 4.5
are better estimate

c) $\sqrt{8}$ is about 2.83

Good estimate since $\sqrt{9} = 3$

d) $\sqrt{34}$ is about 5.83

Good estimate since $\sqrt{36} = 6$

15.

$$\text{Area} = 5 \text{ m}^2$$

Side Length
 $\sqrt{5}$

Homework
Solutions

$$\frac{\sqrt{14}}{2} \quad \frac{\sqrt{5}}{2} \quad \frac{\sqrt{9}}{3}$$

$$\sqrt{5} \approx 2.2$$

b) Justify your answer.

16.

$$\text{Area} = 162 \text{ m}^2$$

Side Length = $\sqrt{162}$

$$\frac{\sqrt{144}}{12} \quad \frac{\sqrt{169}}{13}$$

$$\sqrt{162} \approx 12.3$$

b) Tape around the outside

$$- 4 \times 12.3 = 49.2$$

$\approx 50 \text{ m}$ of tape needed

20 Is the product of 2 perfect squares a perfect square? Homework
Solutions

$$49 \times 64 = 3136 \quad \sqrt{3136} = 56$$

$$36 \times 16 = 576 \quad \sqrt{576} = 24$$

$$144 \times 121 = 17424 \quad \sqrt{17424} = 132$$

$$25 \times 16 = 400 \quad \sqrt{400} = 20$$

$$9 \times 4 = 36 \quad \sqrt{36} = 6$$

$$169 \times 196 = 33124 \quad \sqrt{33124} = 182$$

$$\frac{\sqrt{a \times b}}{\sqrt{a} \times \sqrt{b}} = \sqrt{a \times b}$$

Yes, the product of any two perfect squares will give a perfect square

21. 7.67^2

Is it closer to 49 or 64?

Homework

Solutions

7.67 is closer to 8, so
 7.67^2 is closer to 8^2 or 64.

22. Five numbers whose square roots are between 9 and 10.

$$\sqrt{81} = 9$$

$$\sqrt{100} = 10$$

$$\sqrt{82}, \sqrt{83}, \sqrt{84} \dots \sqrt{98}, \sqrt{99}$$

Homework Solutions

$$23 \text{ a) } \sqrt{81} + \sqrt{16}$$

$$\begin{array}{ccc} 9 & + & 4 \\ & 13 & \end{array}$$

$$\text{b) } \sqrt{81 + 16}$$

$$\sqrt{97}$$

$$\begin{array}{ccc} \sqrt{81} & & \sqrt{100} \\ 9 & & 10 \end{array}$$

$$\sqrt{97} \approx 9.8$$

$$\text{c) } \sqrt{\sqrt{81} + 16}$$

$$\sqrt{9 + 16}$$

$$\sqrt{25}$$

$$5$$

$$\text{d) } \sqrt{81 + \sqrt{16}}$$

$$\sqrt{81 + 4}$$

$$\sqrt{85}$$

$$\approx 9.2$$

$$\text{e) } \sqrt{\sqrt{81} + \sqrt{16}}$$

$$\sqrt{9 + 4}$$

$$\sqrt{13}$$

$$\approx 3.6$$

Class/Homework



Mid-Unit Review

pg. 30 # 1-7, 9-11

$$\sqrt{16} = 4 \quad (4^2 = 16)$$