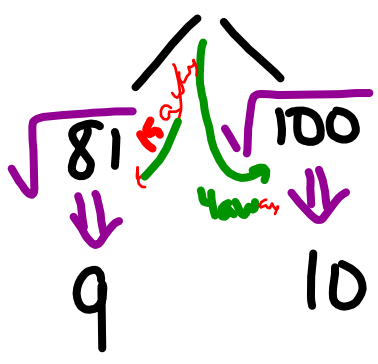
Warm Up

Grade 8

On test

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

1) Estimate $\sqrt{96}$ (Show Work)

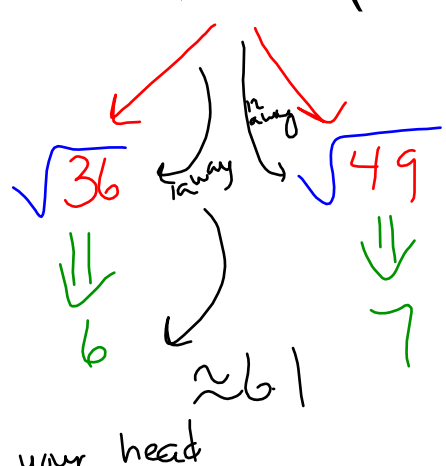


≈ 9.7

In your head

9.1, 9.2, 9.3, 9.4 { 9.5 } 9.6, 9.7, 9.8, 9.9

2) Estimate $\sqrt{37}$ (Show Work)



In your head

6.1, 6.2, 6.3, 6.4 { 6.5 } 6.6, 6.7, 6.8, 6.9

3)A square garden has area 97 m². Side???

a) What are the approximate dimensions of the garden to one decimal places?

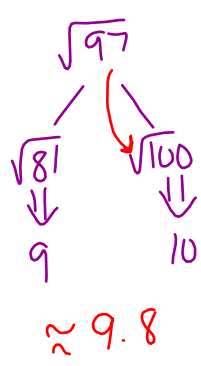
Area = l x w

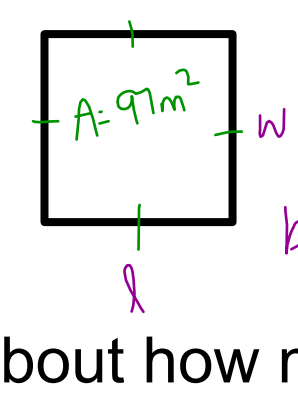
$A_{square} = side^2$

Side = $\sqrt{Area}$

$= \sqrt{97\ m^2}$

≈ 9.8 m

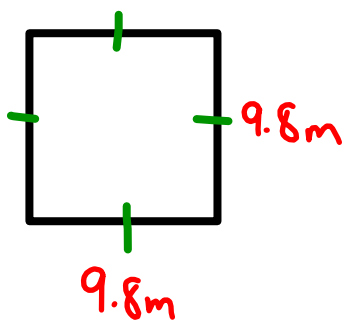




but l = w

The sides of garden are 9.8 m in length.

b) About how much fencing would be needed to go around the garden?



P = S + S + S + S or P_{square} = 4 x side

= 4 x 9.8m

= 39.2m

3

9.8

x 4

39.2

About 39.2m is needed.

Warm Up

Grade 8

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

1) Estimate $\sqrt{96}$ (Show Work)

$\sqrt{81}$ $\sqrt{100}$

9 10

Closer

≈ 9.7

2) Estimate $\sqrt{37}$ (Show Work)

$\sqrt{36}$ $\sqrt{49}$

6 7

≈ 6.1

3)A square garden has area 97 m^2.

A = 97

a) What are the approximate dimensions of the garden to two decimal places?

Side = $\sqrt{97}$

$\sqrt{81}$ $\sqrt{100}$

$= 9$ $= 10$

$\approx$ 9.80

b) About how much fencing would be needed to go around the garden?

↓ Perimeter

P = S + S + S + S

or

4 x Side

= 4 x 9.80

= 39.20

About 39.20 m of fencing is needed.

Homework

Solutions

2. Which type of number has an approximate square root?

Any non perfect # has an approximate Square root. (Any # not in Perfect Square list)

3. How can you use perfect squares to estimate a square root, such as $\sqrt{8}$?

$\sqrt{8}$

$\sqrt{4}$ → 2

$\sqrt{9}$ → 3 closer

$\sqrt{8} \approx 2.8$

Pg 25

4a) $\sqrt{15 \times 15} = \sqrt{15^2}$

15

b) $\sqrt{22 \times 22}$

22

c) $\sqrt{3 \times 3}$

3

d) $\sqrt{1 \times 1}$

1

5 a) $\sqrt{5}$

$\sqrt{4}$ → 2

$\sqrt{9}$ → 3

Est $\sqrt{5} \approx$ 2.1 or 2.2

b) $\sqrt{11}$

$\sqrt{9}$ → 3

$\sqrt{16}$ → 4

Est $\sqrt{11} \approx 3.1$ or 3.2

c) $\sqrt{57}$

$\sqrt{49}$ → 7

$\sqrt{64}$ → 8

Est $\sqrt{57} \approx 7.5$

d) $\sqrt{38}$

$\sqrt{36}$ → 6

$\sqrt{49}$ → 7

$\sqrt{38} \approx 6.1$

e) $\sqrt{171}$

$\sqrt{169}$ → 13

$\sqrt{196}$ → 14

Est $\sqrt{171} \approx 13.1$

f) $\sqrt{115}$

$\sqrt{100}$ → 10

$\sqrt{121}$ → 11

$\sqrt{115} \approx 10.7$

#5) a) $\sqrt{5}$

$\sqrt{4}$ — $\sqrt{9}$

= 2 = 3

$\sqrt{5} \approx 2.1$

b) $\sqrt{11}$

$\sqrt{9}$ — $\sqrt{16}$

= 3 = 4

closer

$\sqrt{11} \approx 3.2$

c) $\sqrt{57}$

$\sqrt{49}$ $\sqrt{64}$ —

= 7 = 8

$\sqrt{57} \approx 7.6$

d) $\sqrt{38}$

$\sqrt{36}$ $\sqrt{49}$ —

= 6 = 7

closer

$\sqrt{38} \approx 6.2$

e) $\sqrt{171}$

$\sqrt{169}$ $\sqrt{144}$ 196

= 13 = 14

$\sqrt{171} \approx 13.1$

e) $\sqrt{115}$

$\sqrt{100}$ $\sqrt{121}$ —

= 10 = 11

closer

$\sqrt{115} \approx 10.7$

#7) $\sqrt{23}$

$\sqrt{16}$ $\sqrt{25}$

= 4 = 5

closer to 5

so 4.7

X

$\sqrt{30}$

$\sqrt{25}$ $\sqrt{36}$

= 5 = 6

closer to 5

so 5.4

✓

$\sqrt{64} = 8$ ✓

$\sqrt{72}$

$\sqrt{64}$ $\sqrt{81}$

= 8 = 9

closer to 8

so 8.4

✓

Class/Homework

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

Page 26-27

No calculators

Use estimation for all

Warm Up →

8 (a,b,c,d)

#9 (a,b,c,d)

#11 (a,b,c) SHOW WORK

#12(a,d)

#13(a,d)

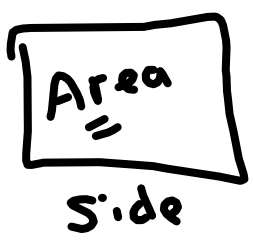
#14(a,d)

#15(a,b) Show work

#16(a,b)

#21

#23 (a,b,c)



Side = $\sqrt{\text{Area}}$

13A) Area = 92

Side = $\sqrt{92}$



Test in 2 days

Quiz outline

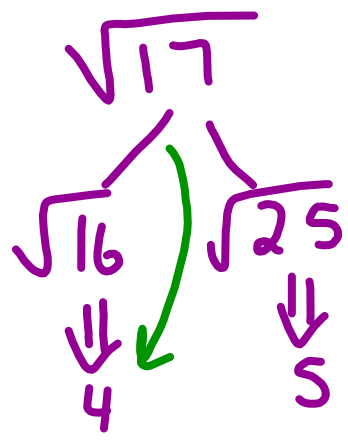
Page 1 (No Calculators)

- 5 MC 3 Short Response
  - Must know $\sqrt{x^2} = x$ or $(\sqrt{x})^2 = x$
  - Must know difference of square root of a number & squaring a number
  - If a number has an odd or even number of factors then what does that tell you about the number

Page 2) (Calculator)

- Product of perfect squares
- Product of Primes

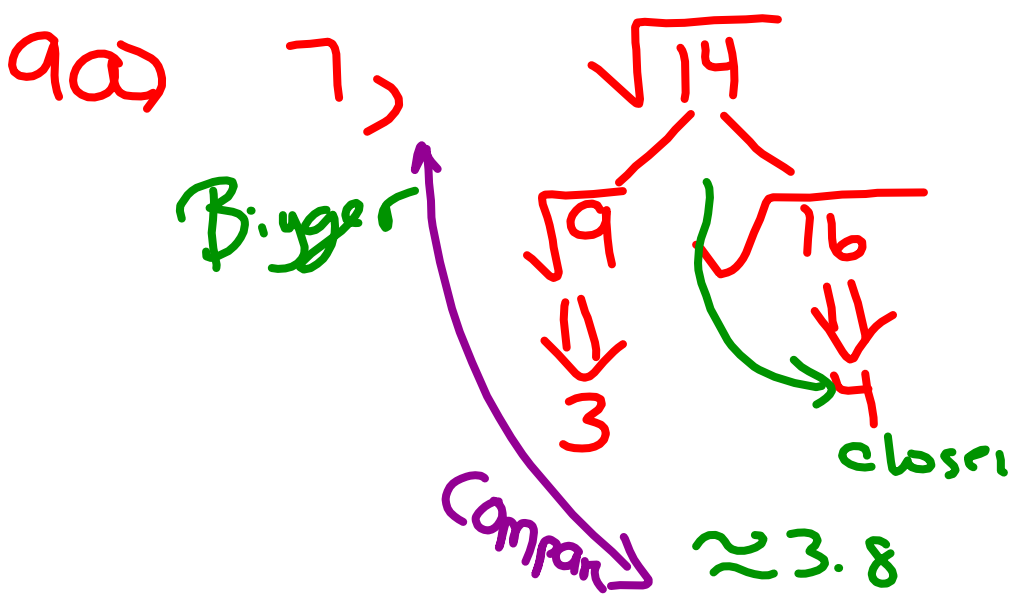
14a)

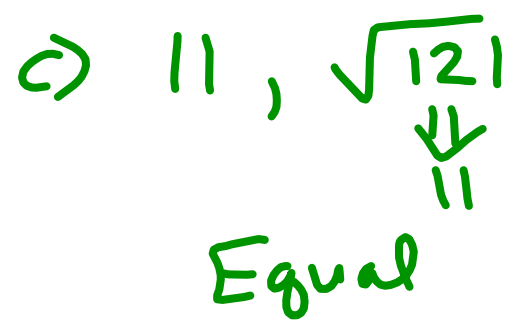


≈4.2

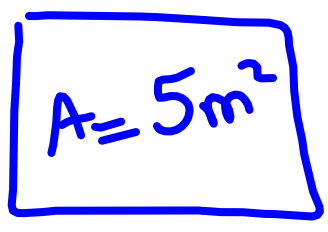
Not 8.50
Fals

b) $\sqrt{20}$


9 and 7
√14
√9
√16
3
4
Bigger
closer
Compare
≈3.8


11 , √121
11
Equal

15 a)



$$\text{Side} = \sqrt{\text{Area}}$$

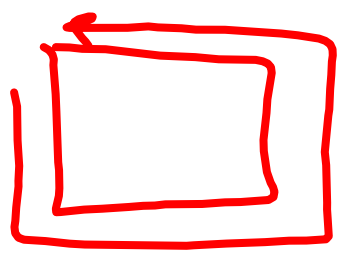
$$= \sqrt{5}$$

$$\sqrt{4} \quad \sqrt{9}$$

$$2 \quad 3$$

Side = 2.2 m

b)



$$P = S + S + S + S$$

$$= 4 \times 2.2$$

$$= 8.8\text{m}$$

Buy 10m

9) a) 7, $\sqrt{14}$

$\sqrt{9}$ $\sqrt{16}$

3 4

≈ 3.6

7

Bigger

WS 26-27

8. Use a copy of this number line.
Place each square root on the number line to show its approximate value.

a) $\sqrt{11}$ **b)** $\sqrt{40}$

c) $\sqrt{30}$ **d)** $\sqrt{55}$



9. In each pair, is the given whole number greater than, less than, or equal to the square root?
Justify your answer.

a) $7, \sqrt{14}$ **b)** $8, \sqrt{60}$ **c)** $11, \sqrt{121}$ **d)** $12, \sqrt{150}$

10. Which whole number is each square root closer to?
How do you know?

a) $\sqrt{58}$ **b)** $\sqrt{70}$ **c)** $\sqrt{90}$ **d)** $\sqrt{151}$

11. Is each statement true or false? Explain.

a) $\sqrt{17}$ is between 16 and 18. **b)** $\sqrt{5} + \sqrt{5}$ is equal to $\sqrt{10}$. **c)** $\sqrt{131}$ is between 11 and 12.

12. Use guess and test to estimate each square root to two decimal places. Record each trial.

a) $\sqrt{23}$ **b)** $\sqrt{13}$ **c)** $\sqrt{78}$

d) $\sqrt{135}$ **e)** $\sqrt{62}$ **f)** $\sqrt{45}$

13. Find the approximate side length of the square with each area. Give each answer to one decimal place.

a) 92 cm^2 **b)** 430 m^2

c) 150 cm^2 **d)** 29 m^2

14. Which estimates are good estima the square roots? Explain your reasoning.

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

b) $\sqrt{20}$ is about 4.30.

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

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

15. **Assessment Focus** A student uses a square canvas for her painting. The canvas has area 5 m^2. She wants to frame her artwork.

a) What are the dimensions of the square frame to two decimal places?

b) The framing can be purchased in 5-m or 10-m lengths.
Which length of framing should she purchase? Justify your choice.

16. A square lawn is to be reseeded. The lawn has area 152 m^2.

a) What are the approximate dimensions of the lawn to two decimal places?

b) A barrier of yellow tape is placed around the lawn to keep people off. About how much tape is needed?

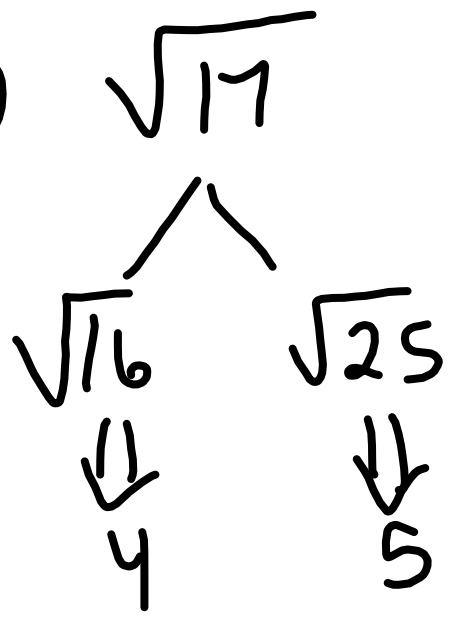
21. **Take It Further** An approximate square root of a whole number is 7.67. Is the whole number closer to 49 or 64? How do you know?

23. **Take It Further** Simplify each expression. Give your answer to two decimal places when necessary.

a) $\sqrt{81} + \sqrt{16}$ **b)** $\sqrt{81 + 16}$ **c)** $\sqrt{\sqrt{81} + 16}$

d) $\sqrt{\sqrt{81} + \sqrt{16}}$ **e)** $\sqrt{\sqrt{81} + \sqrt{16}}$

11a) $\sqrt{17} \Rightarrow 16, 18$



$\sqrt{17}$ is between 4, 5 Not 16 and 18

False

11b) $\sqrt{5} + \sqrt{5} \stackrel{?}{=} \sqrt{10}$

$\sqrt{4}$ $\sqrt{9}$

2 3

≈ 2.1

$\sqrt{9}$ $\sqrt{16}$

3 4

≈ 3.1

$2.1 + 2.1 \stackrel{?}{=}$ Not same

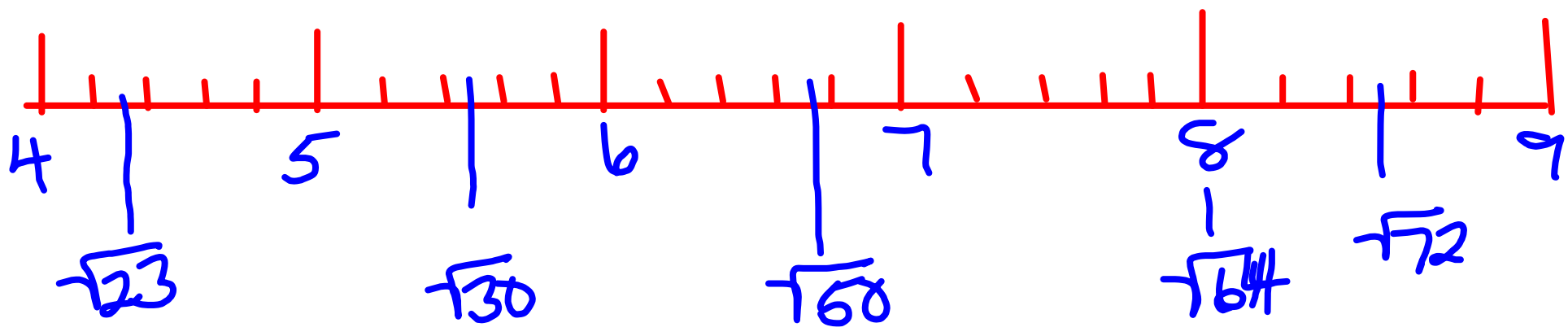
4.2

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

$\sqrt{7} \approx 2.7$

Homework Solutions

7.



a) The estimates that are good are

$\sqrt{30}$ 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) $\sqrt{55}$

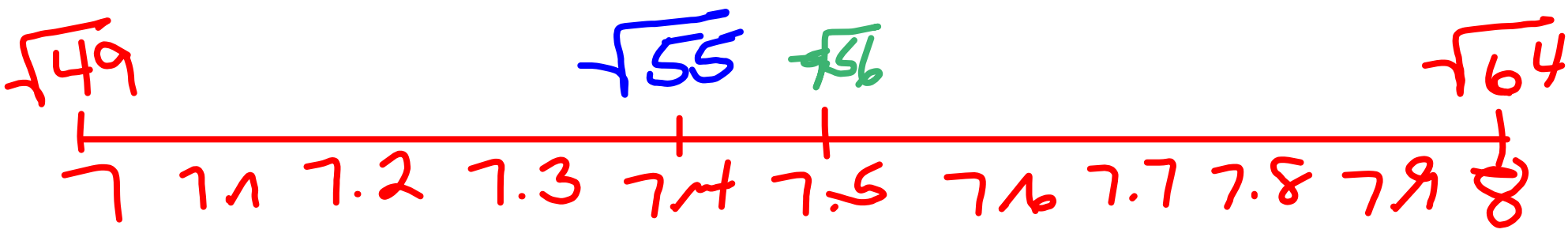
$\sqrt{49}$ $\sqrt{64}$

7 8

$\sqrt{55} \approx 7.4$

Middle between 49 and 64

≈ 56



Homework Solutions

9. 7, $\sqrt{14}$

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

b) 8, $\sqrt{60}$

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

c) 11, $\sqrt{121}$

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

d) 12, $\sqrt{150}$

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

10 a) $\sqrt{58}$

$\sqrt{49}$ $\sqrt{64}$

7 8

$\sqrt{58} \approx 7.8$

b) $\sqrt{70}$

$\sqrt{64}$ $\sqrt{81}$

8 9

$\sqrt{70} \approx 8.3$

c) $\sqrt{90}$

$\sqrt{81}$ $\sqrt{100}$

9 10

$\sqrt{90} \approx 9.5$

d) $\sqrt{151}$

$\sqrt{144}$ $\sqrt{169}$

12 13

$\sqrt{151} \approx 12.2$

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) $\sqrt{131}$ is between 11 and 12

True

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

and 131 is between 121 and 144