Unit 1 Test Review Worksheet SOLUTIONS

Show your work for the following

1. List the factors of 216. Is the number a perfect square? Explain with numbers of fact

1×216, 2×108, 3×72, 4×57, 6×36, 8×27, 9×24, 12×18

1, 2, 3, 4, 5, 6, 8, 9, 12, 18, 24, 27, 36, 57, 72, 108, 216

even # of factors

not a perfect square

225, 196, 169, 144, 121,

1, 4, 9, 16, 25, 36, 49, 64, 81, 100

2. Find the square root of the following using the given method:

(a) $\sqrt{1764}$ – product of perfect squares

$\sqrt{(9)(196)}$

$\sqrt{9} \times \sqrt{196}$

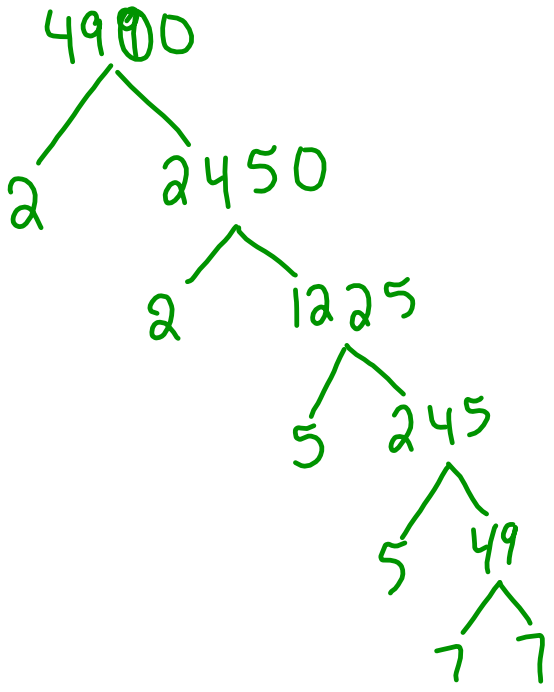
3×14

42

3 pts

(b) $\sqrt{4900}$ – prime factorization **(hint: TREE)**

2, 3, 5, 7, 9, 11, 13, . . .



$\sqrt{4900} = \sqrt{2 \times 2 \times 5 \times 5 \times 7 \times 7}$

$= \sqrt{2 \times 2} \times \sqrt{5 \times 5} \times \sqrt{7 \times 7}$

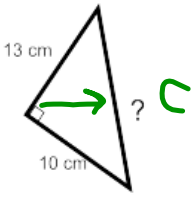
$= 2 \times 5 \times 7$

$\sqrt{4900} = 70$

4 pt

3. Find the length of the indicated side in each triangle (SHOW WORK)

(a)



$c^2 = a^2 + b^2$

$c^2 = (10)^2 + (13)^2$

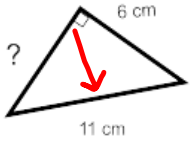
$c^2 = 100 + 169$

$c^2 = 269$

$c = \sqrt{269}$

$c = 16.4$

(b)



c

$a^2 = c^2 - b^2$

$= (11)^2 - (6)^2$

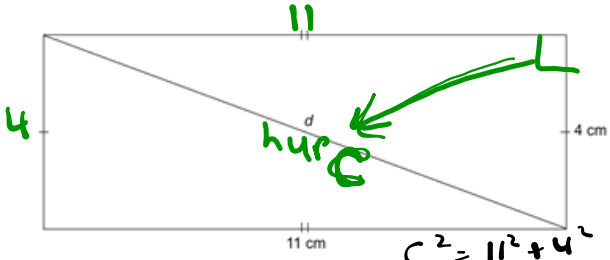
$= 121 - 36$

$a^2 = 85$

$a = \sqrt{85}$

$a = 9.2$

4. Find the length of the diagonal, d, in this rectangle.



hyp

$c^2 = 11^2 + 4^2$
$= 121 + 16$
$c^2 = 137$
$c = \sqrt{137}$
$c = 11.7$

$c^2 = a^2 + b^2$
$= (17)^2 + (8)^2$
$=$
$c^2 = 289 + 64$
$c = \sqrt{353}$
$c = 18.8\text{ cm}$

5. Simplify.

a) square 49 49^2 = 2401

b) square root of 36 $\sqrt{36}$ = 6

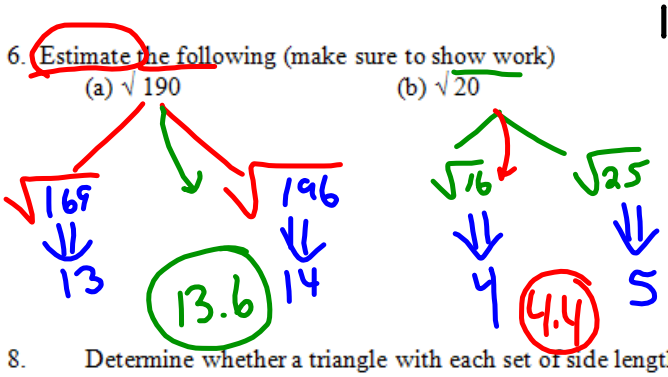
c) $(\sqrt{35})^2$ = 35

$\sqrt{7 \times 7} = 7$ } Rules

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

6. Estimate the following (make sure to show work)

(a) $\sqrt{190}$ (b) $\sqrt{20}$



8. Determine whether a triangle with each set of side lengths is a right triangle. Justify your answers. (Show work)

8cm, 9 cm, and 11 cm

c

c^2	$a^2 + b^2$
11^2	$(8)^2 + (9)^2$
121	$64 + 81$
	145

Not equal

8, 9, 11 does Not form a Right △

10. A trucker has two companies to choose to work at.
Company A follows route 1 and pays $15/km
Company B follows route 2 and pays $19/km

Total Distance

a) What is the trucker's pay if he goes with company A?

62 km + 36 km = 98 km

X 15

$1470

get paid $1470 w company A

b) What is the trucker's pay if he goes with company B?
(Note: this requires 2 steps)

$c^2 = a^2 + b^2$

$= (62)^2 + (36)^2$

$c^2 = 3844 + 1296$

$c^2 = 5140$

$c = \sqrt{5140}$

$c = 71.7$ km

71.7 km

X $19

$1362.20

get paid $1362.20 w company B

c) Which is the better option? Explain

Company A pays $1470

$107.8 more

Review for Test

Know what perfect squares are (be able to explain and/ or model)
- odd number of factor means perfect square
- Repeated factor means perfect square
- Even number of factor then not a perfect square
- Model would be to draw a square and label the side lengths

Know the perfect squares from 1 - 225
1 4 9 16 25 36 49 64 81 100 121 144 169 196 225

If given the area of a square, be able to find the side length and vice versa.
Area = $(\text{side})^2$ AND Side = $\sqrt{\text{Area}}$

Know what square roots are and be able to find the square roots using:
- factors
- product of perfect squares
- prime factorization
- using a calculator

Be able to **estimate** square roots using the perfect squares before and after the number.

Know what the Pythagorean Theorem is, know when and how to use it. $c^2 = a^2 + b^2$ $a^2 = c^2 - b^2$

Be able to determine is a triangle is a right triangle, or if a set of numbers is a Pythagorean triple. $c^2 \} a^2 + b^2$

Be able to apply the Pythagorean Theorem to word problems.

Homework Sheet Extra Practice 7 # 1-6
pg. 55 # 1-5

Class/Homework

Page 49
#11, #17

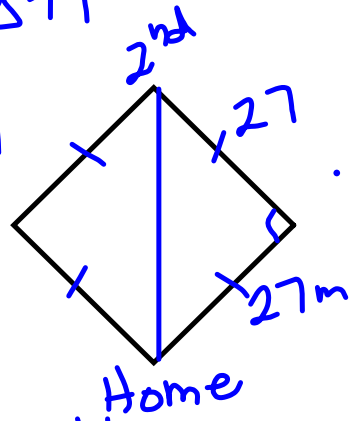
Page 55
#4(a,d), #7, #9(a,b,c), #11(a), #14(a,f),

Page 56
#17(a,b), #18(a,b), #19(a), #21, #27

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

Pg 49

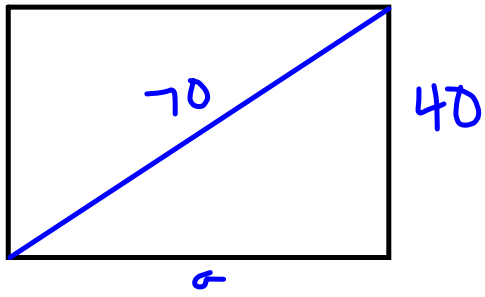
11.



$c^2 = a^2 + b^2$
$c^2 = 27^2 + 27^2$
$c^2 = 729 + 729$
$c^2 = 1458$
$\sqrt{c^2} = \sqrt{1458}$
$c = 38.2\text{m}$

The throw must be 38.2 m

13.



$c^2 = a^2 + b^2$
$70^2 = a^2 + 40^2$
$4900 = a^2 + 1600$
$4900 - 1600 = a^2 + 1600 - 1600$
$3300 = a^2$
$\sqrt{3300} = \sqrt{a^2}$
$57.4\text{ cm} = a$

The length is 57.4 cm

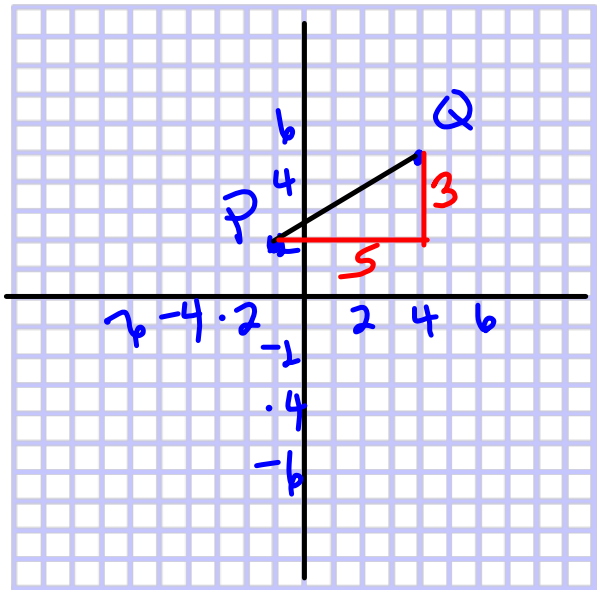
14. To get from A to B, you move right 4 and up 3.

To get from A to F, you move down 3 and left 4, so F is the same distance from A as B is.

15.

P (−1, 2)

Q (4, 5)



$c^2 = a^2 + b^2$

$c^2 = 3^2 + 5^2$

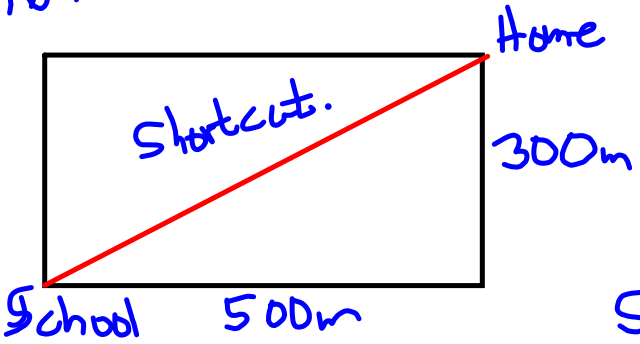
$c^2 = 9 + 25$

$c^2 = 34$

$\sqrt{c^2} = \sqrt{34}$

$c = 5.8$

16.



Joanna normally walks 800m

Short cut

$c^2 = a^2 + b^2$

$c^2 = 300^2 + 500^2$

$c^2 = 9000 + 25000$

$c^2 = 34000$

$\sqrt{c^2} = \sqrt{34000}$

$c = 583$

800

−583

217

The shortcut is 217m shorter

17. Does 650, 720 and 970 form a right triangle

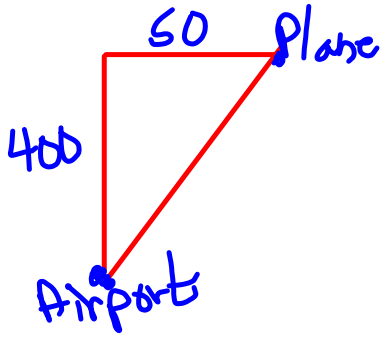
970^2 $650^2 + 720^2$

$422500 + 518400$

940900 940900

Yes they were travelling at right angles.

18.



$c^2 = a^2 + b^2$

$c^2 = 400^2 + 50^2$

$c^2 = 160000 + 2500$

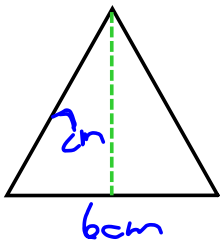
$c^2 = 162500$

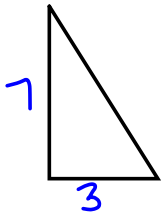
$\sqrt{c^2} = \sqrt{162500}$

$c = 403.1$ km

The plane is 403.1 km from the airport

19.

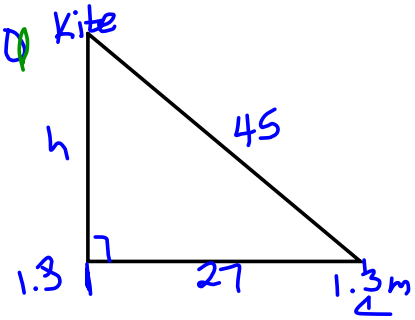




$c^2 = a^2 + b^2$
$c^2 = 7^2 + 3^2$
$c^2 = 49 + 9$
$c^2 = 58$
$\sqrt{c^2} = \sqrt{58}$
$c = 7.6$ cm

The slant height is 7.6 cm

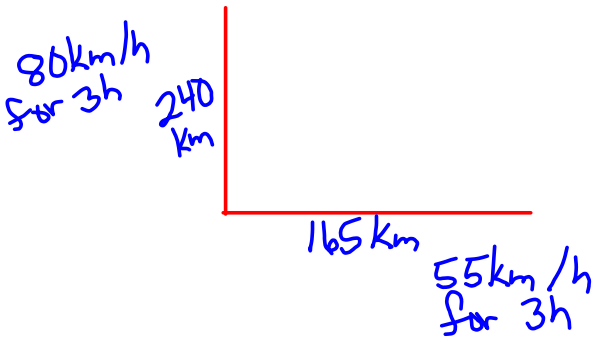
20 Kite



$c^2 = a^2 + b^2$
$45^2 = a^2 + 27^2$
$2025 = a^2 + 729$
$2025 - 729 = a^2 + 729 - 729$
$1296 = a^2$
$\sqrt{1296} = \sqrt{a^2}$
$36 = a$

The kite is 36 + 1.3 or 37.3m in the air.

22. - Discuss



line length

$\sqrt{5}$

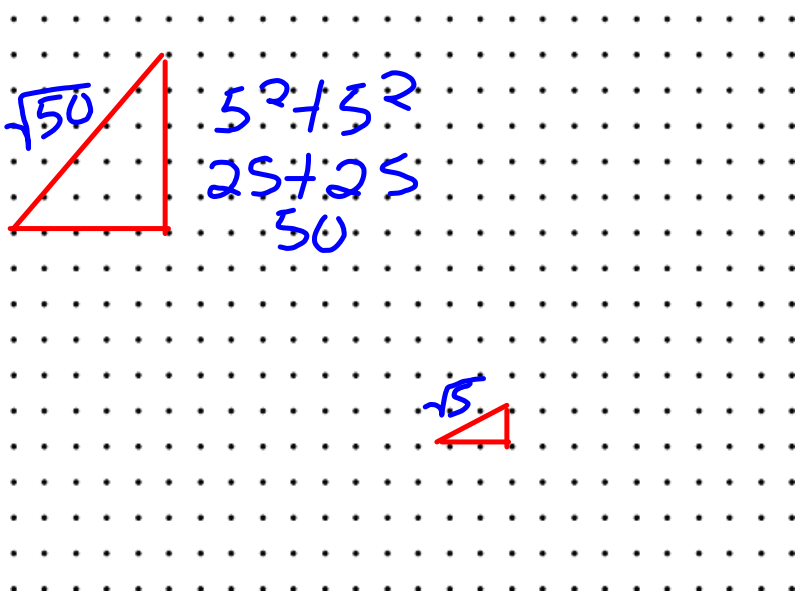
$(\sqrt{5})^2 = 5$

$a^2 + b^2 = 5$

$1 + 4$

$a^2 = 1 \quad b^2 = 4$

$a = 1 \quad b = 2$

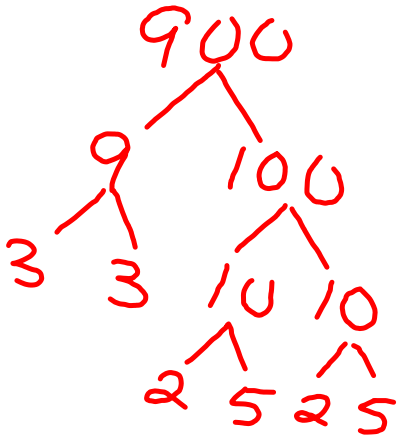


$\sqrt{900} = \sqrt{9 \times 100}$

$= \sqrt{9} \times \sqrt{100}$

$= 3 \times 10$

$= 30$



$\sqrt{2 \times 2 \times 3 \times 3 \times 5 \times 5}$

$= 2 \times 3 \times 5$

$= 30$

900

1 x 900
2 x 450
3 x 300
4 x 225
5 x 180
6 x 150
9 x 100
10 x 90
12 x 75
15 x 60
20 x 45
25 x 36
30 x 30

25 factors - odd
so perfect square

$30 \times 30 = 900$

so $\sqrt{900} = 30$