

Warm up

1) If a number has 13 factors, what can you tell me about that number?

2) Show the symbol for each then work it out on a calculator

a) Square 49 b) Square root 81

3) a) find 16^2

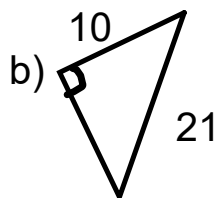
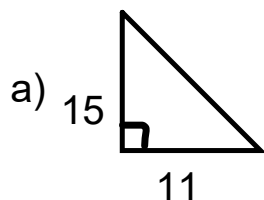
b) $\sqrt{900}$

4) Show work to Estimate

a) $\sqrt{74}$

b) $\sqrt{245}$

5) Find the missing side to one decimal place (Show all work)



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 8×27 1, 2, 3, 4, 5, 6, 8, 9, 12, 18, 27, 36, 54, 72, 108, 216
 2×108 9×24
 3×72 12×18
 4×54
 6×36

even # of factors
not a perfect square

225
196
169
144
121

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

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

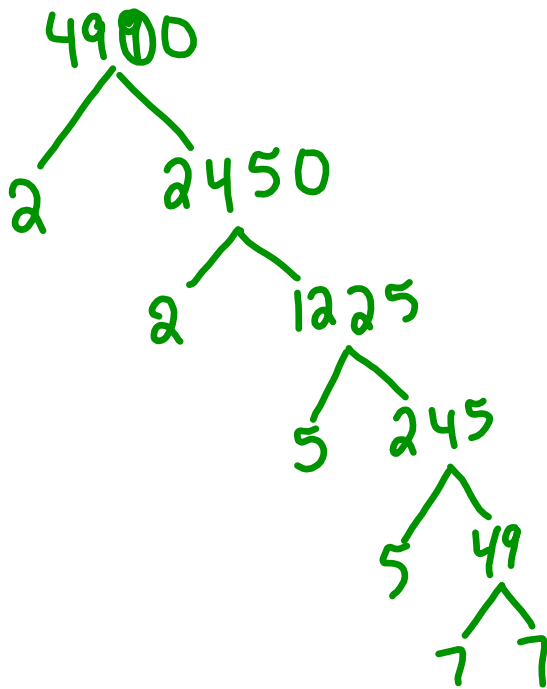
1, 4, 9, 16, 25, 36, 49, 64, 81, 100

$\sqrt{(9) \times (196)}$
 $\sqrt{9} \times \sqrt{196}$
 3×14
 42

3 pts

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

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

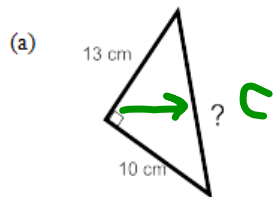


$\sqrt{4900} = \sqrt{2 \times 2 \times 5 \times 5 \times 7 \times 7}$
 $= \sqrt{2 \times 2} \times \sqrt{5 \times 5} \times \sqrt{7 \times 7}$
 $= 2 \times 5 \times 7$

4 pt

$\sqrt{4900} = 70$

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



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

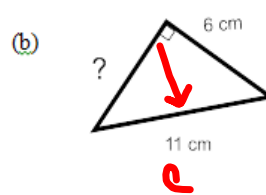
$$c^2 = (10)^2 + (13)^2$$

$$c^2 = 100 + 169$$

$$c^2 = 269$$

$$c = \sqrt{269}$$

$$c = 16.4$$



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

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

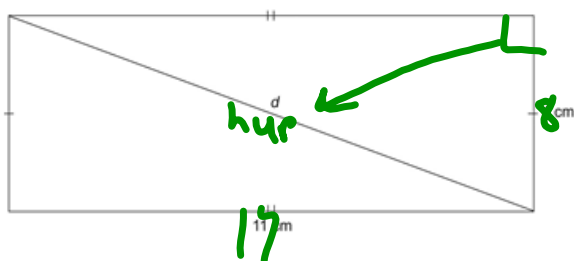
$$= 121 - 36$$

$$a^2 = 85$$

$$a = \sqrt{85}$$

$$a = 9.2$$

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



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

5. Simplify.
- a) square 49 $49^2 = \underline{2401}$
- b) square root of 36 $= \underline{6}$
- c) $(\sqrt{35})^2 = \underline{35}$

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

(a) $\sqrt{190}$

$\sqrt{169}$ $\sqrt{196}$
 \downarrow \downarrow
 13 14

13.6

(b) $\sqrt{20}$

$\sqrt{16}$ $\sqrt{25}$
 \downarrow \downarrow
 4 5

4.4

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^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 Δ

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



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

$$62 \text{ km} + 36 \text{ km} = 98 \text{ km}$$

$$\begin{array}{r} \times 15 \\ \hline \$ 1470 \end{array}$$

get paid \$1470
w/ company A

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

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

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

$$c^2 = 3844 + 1296$$

$$c^2 = 5140$$

$$c = \sqrt{5140}$$

$$c = 71.7 \text{ km}$$

$$\begin{array}{r} 71.7 \text{ km} \\ \times \$ 19 \\ \hline \$ 1362.20 \end{array}$$

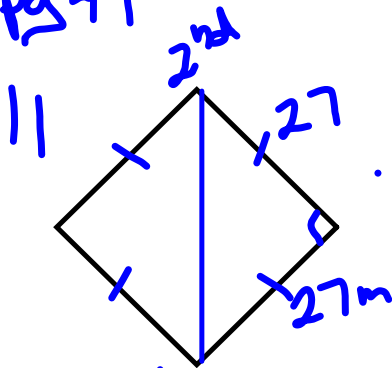
get paid \$1362.20
w/ company B

- c) Which is the better option? Explain

Company A pays \$1470

\$107.8 more

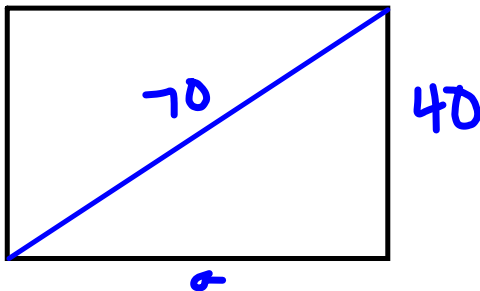
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The throw must be 38.2 m

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

13.



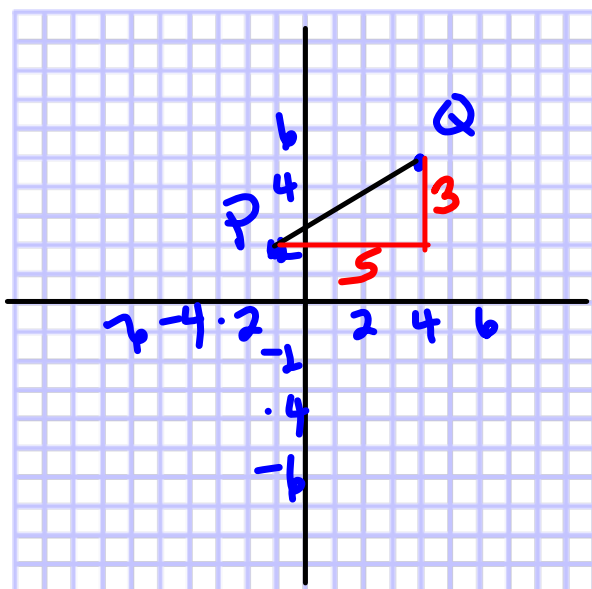
$$\begin{aligned}
 c^2 &= a^2 + b^2 \\
 70^2 &= a^2 + 40^2 \\
 4900 &= a^2 + 1600 \\
 4900 - 1600 &= a^2 + 1600 - 1600 \\
 3300 &= a^2 \\
 \sqrt{3300} &= \sqrt{a^2} \\
 57.4 &= a \\
 &\text{cm}
 \end{aligned}$$

The length is 57.4 cm

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

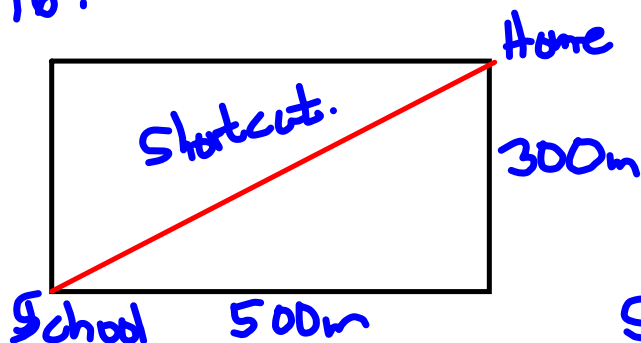
To get from A to F, you move down 3 and left 4, so F is the same distance from A as B is.

15.
 P (-1, 2)
 Q (4, 5)



$$\begin{aligned}
 c^2 &= a^2 + b^2 \\
 c^2 &= 3^2 + 5^2 \\
 c^2 &= 9 + 25 \\
 c^2 &= 34 \\
 \sqrt{c^2} &= \sqrt{34} \\
 c &= 5.8
 \end{aligned}$$

16.



Joanna normally walks 800m

$$\begin{aligned}
 \text{Short cut} \\
 c^2 &= a^2 + b^2 \\
 c^2 &= 300^2 + 500^2 \\
 c^2 &= 9000 + 25000 \\
 c^2 &= 34000 \\
 \sqrt{c^2} &= \sqrt{34000} \\
 c &= 583
 \end{aligned}$$

$$\begin{array}{r}
 79 \\
 806 \\
 -583 \\
 \hline
 217
 \end{array}$$

The shortcut is 217m shorter

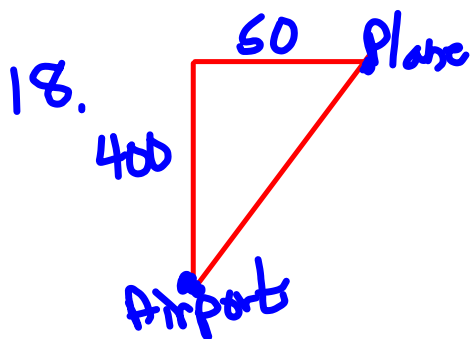
17. Does 650, 720 and 970 form a right triangle

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

$$940900 = 422500 + 518400$$

$$940900 = 940900$$

Yes they were travelling at right angles.



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

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

$$c^2 = 160000 + 2500$$

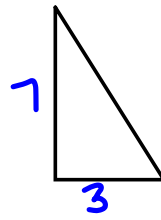
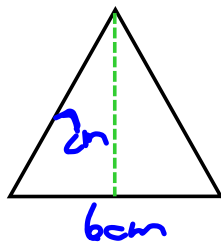
$$c^2 = 162500$$

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

$$c = 403.1 \text{ km}$$

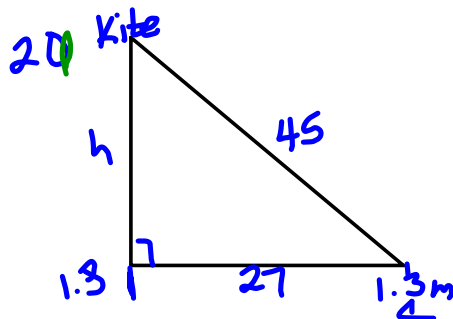
The plane is 403.1 km from the airport

19.



$$\begin{aligned} c^2 &= a^2 + b^2 \\ c^2 &= 7^2 + 3^2 \\ c^2 &= 49 + 9 \\ c^2 &= 58 \\ \sqrt{c^2} &= \sqrt{58} \\ c &= 7.6 \text{ cm} \end{aligned}$$

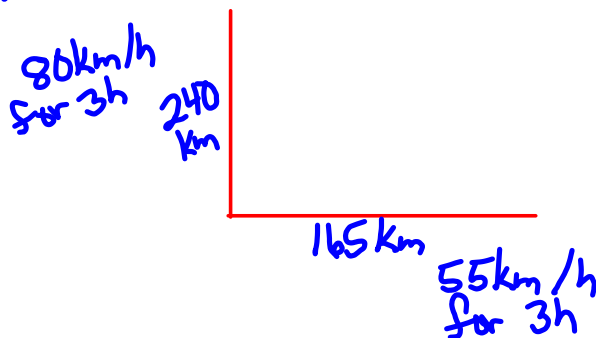
The slant height
is 7.6 cm



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

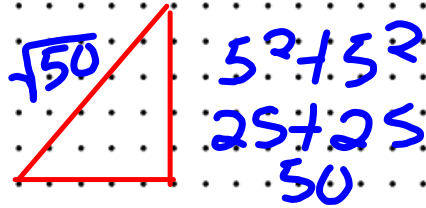
The kite is $36 + 1.3$ or 37.3 m
in the air.

22. - Discuss



line length

$$\sqrt{5}$$



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

$$a^2 + b^2 = 5$$

$$1 + 4$$

$$a^2 = 1$$

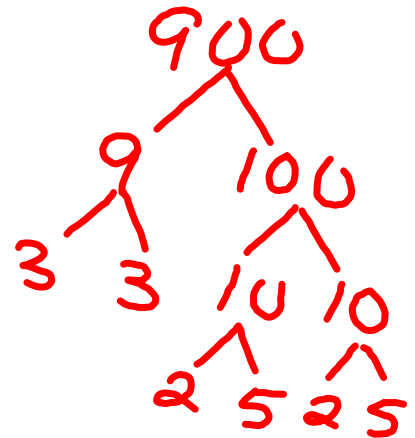
$$a = 1$$

$$b^2 = 4$$

$$b = 2$$



$$\begin{aligned}\sqrt{900} &= \sqrt{9 \times 100} \\ &= \sqrt{9} \times \sqrt{100} \\ &= 3 \times 10 \\ &= 30\end{aligned}$$



$$\begin{aligned}\sqrt{2 \times 2 \times 3 \times 3 \times 5 \times 5} \\ = 2 \times 3 \times 5 \\ = 30\end{aligned}$$

$$\begin{array}{l} 900 \\ \sqrt{1 \times 900} \\ 2 \times 450 \\ 3 \times 300 \\ 4 \times 225 \\ 5 \times 180 \\ 6 \times 150 \\ 9 \times 100 \\ 10 \times 90 \\ 12 \times 75 \\ 15 \times 60 \\ 20 \times 45 \\ 25 \times 36 \\ 30 \times 30 \end{array}$$

25 factors - odd
so perfect square

$$30 \times 30 = 900$$

$$\text{so } \sqrt{900} = 30$$