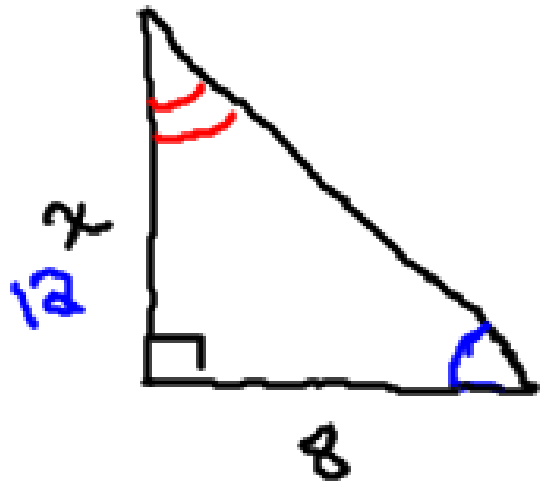
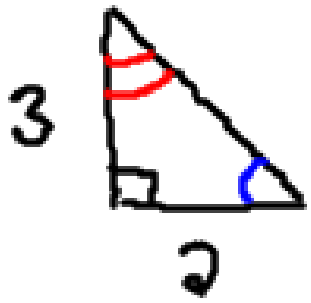
Omit 12 & 13

similar triangles





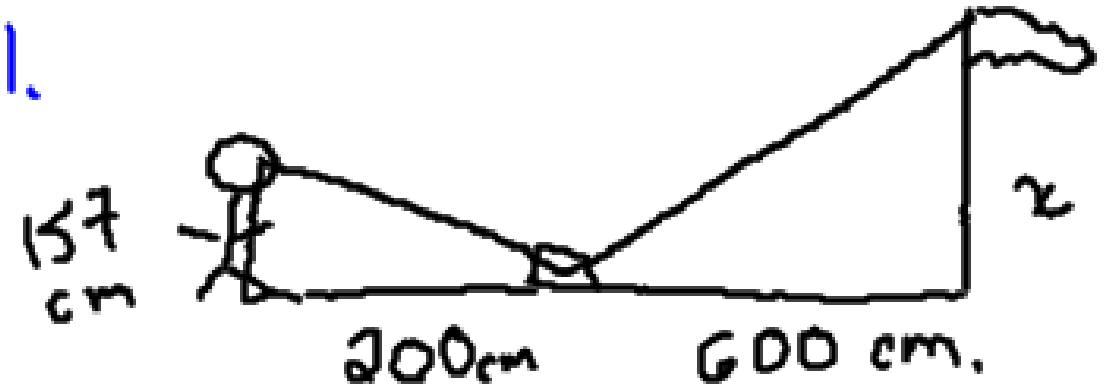
small $\frac{2}{8} = \frac{3}{x}$

big $\frac{8}{2} = \frac{x}{3}$

$2x = 24$

$x = 12$

1.



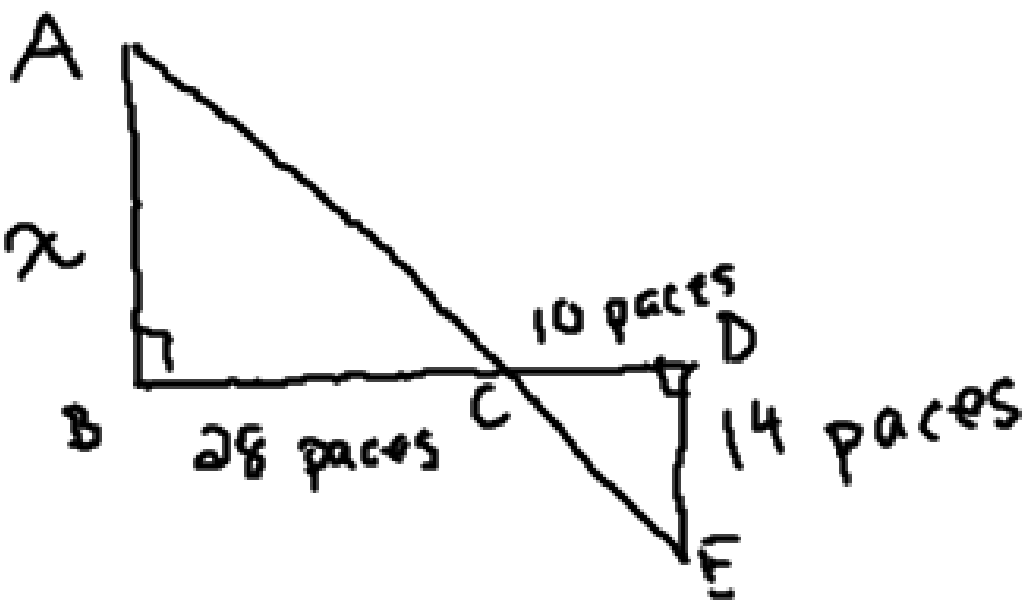
$$\frac{200}{600} = \frac{157}{x}$$

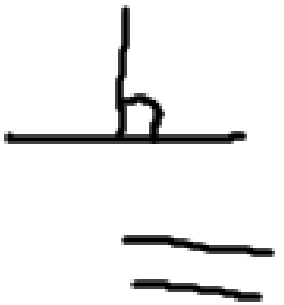
$$\frac{2}{6} = \frac{157}{x}$$

$$\frac{1}{3} = \frac{157}{x}$$

$$x = 471\,cm$$

8.





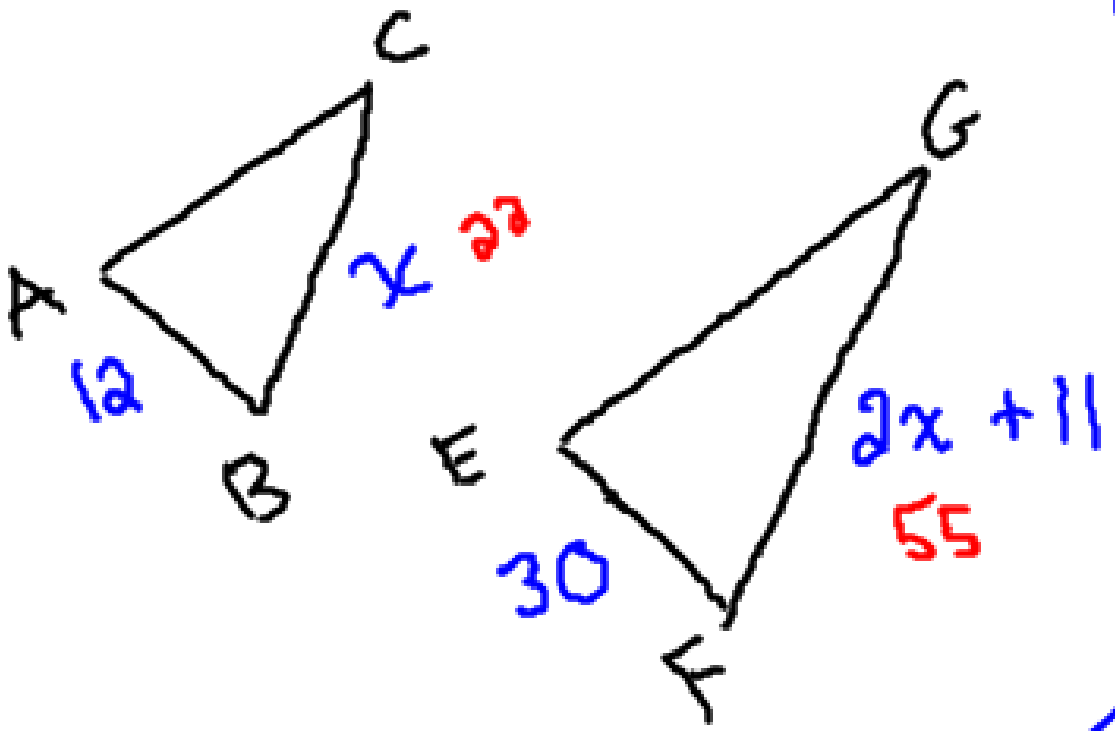
$$\frac{x}{14} = \frac{28}{10}$$

$$10x = 392$$

$$x = 39.2 \text{ paces}$$

16. What is x?

$FG = 55$



$\frac{12}{30} = \frac{x}{(2x+11)}$

$P(12)(2x+11) = 30x$

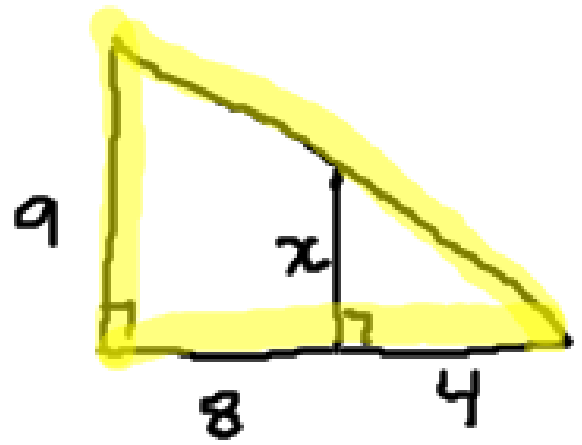
$24x + 132 = 30x$

$-24x \quad -24x$

$\frac{132}{6} = \frac{6x}{6}$

$22 = x$

9.



$$\frac{x}{9} = \frac{4}{12}$$

$$12x = 36$$

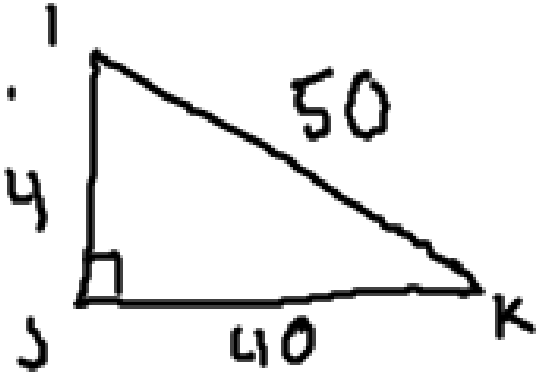
$$x = 3$$

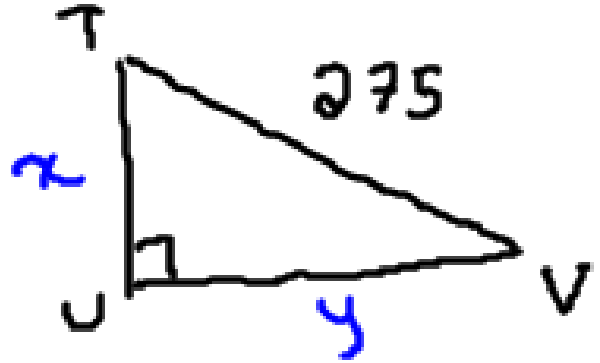
$$\frac{x}{9} = \frac{1}{3}$$

$$x = \frac{9}{3}$$

$$x = 3$$

16.





$$\frac{x}{24} = \frac{275}{50}$$

$$x = 132$$

$$\frac{y}{40} = \frac{275}{50}$$

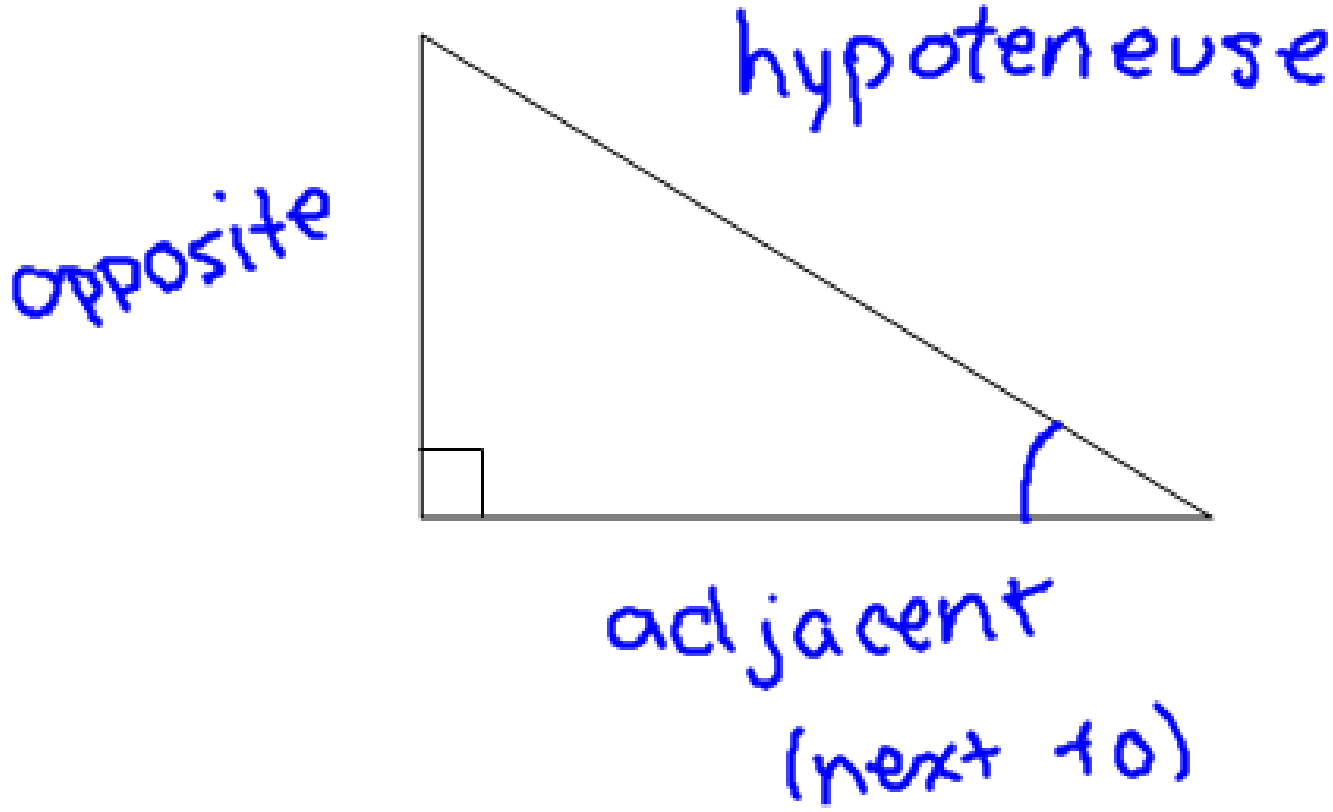
$$y = 220$$

$$P = 275 + x + y$$

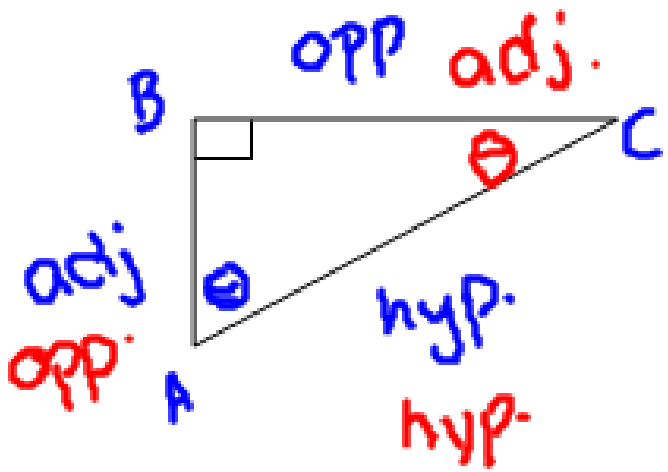
$$= 275 + 132 + 220$$

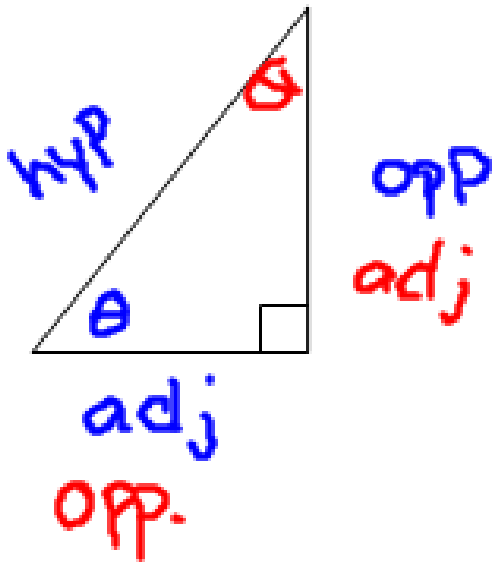
$$P = 627 \text{ units}$$

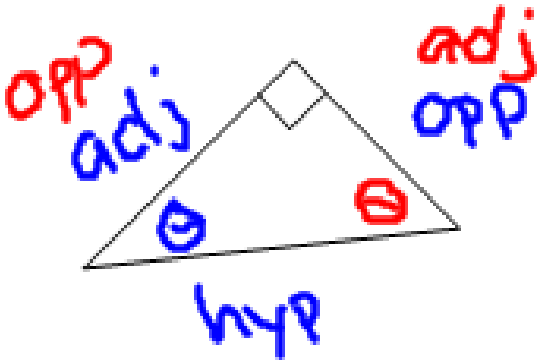
Right Triangle Trigonometry



θ : theta

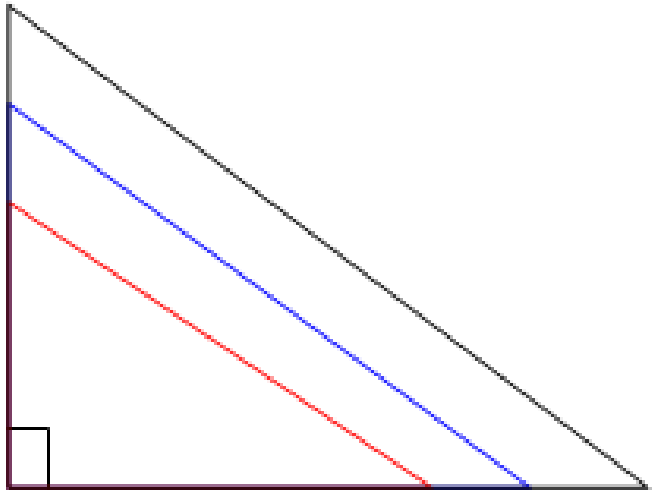

B
C
A
θ
θ
opp
adj.
adj
opp.
hyp.
hyp.

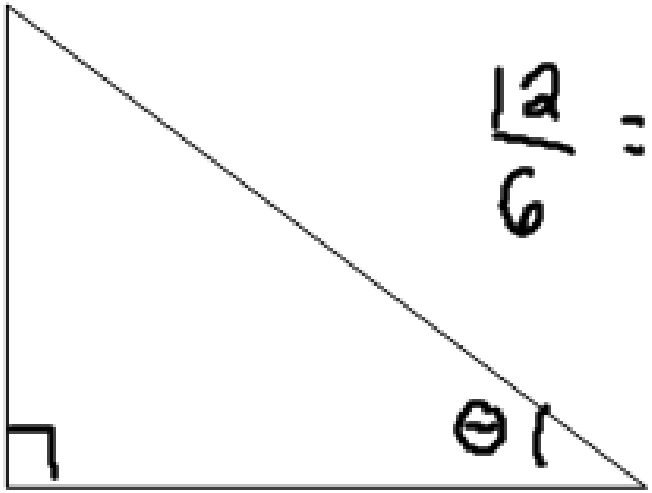

θ
θ
hyp
opp
adj
adj
opp.


θ
θ
opp
adj
adj
opp
hyp

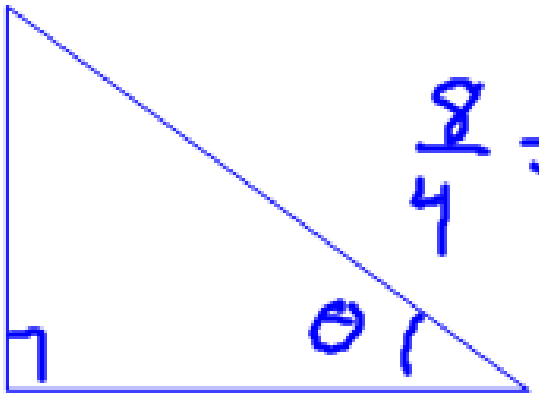
Similar Triangles.....

$\frac{opp}{adj}$

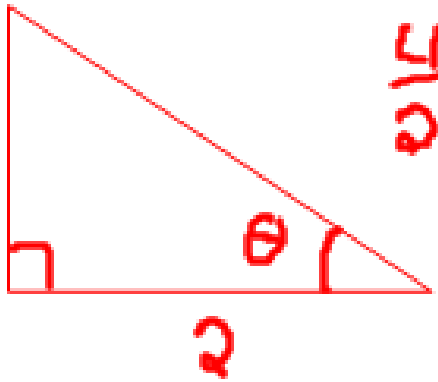




$\frac{12}{6} = 2$



$\frac{8}{4} = 2$

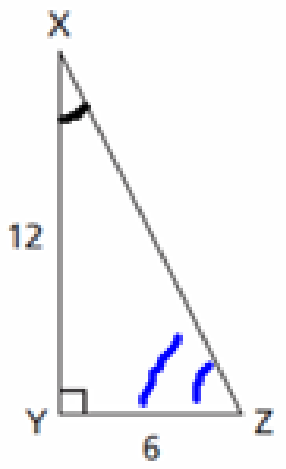


$\frac{4}{2} = 2$

$\text{tangent ratio} = \frac{opp}{adj}$

$\tan\theta = \frac{opp}{adj}$

1. Determine tan X and tan Z.



$$\tan X = \frac{opp}{adj}$$

$$\tan x = \frac{6}{12} = \tan X = \frac{1}{2}$$

$$\tan X = 0.5$$

$$\tan Z = \frac{opp}{adj}$$

$$\tan Z = \frac{12}{6}$$

$$\tan Z = 2$$

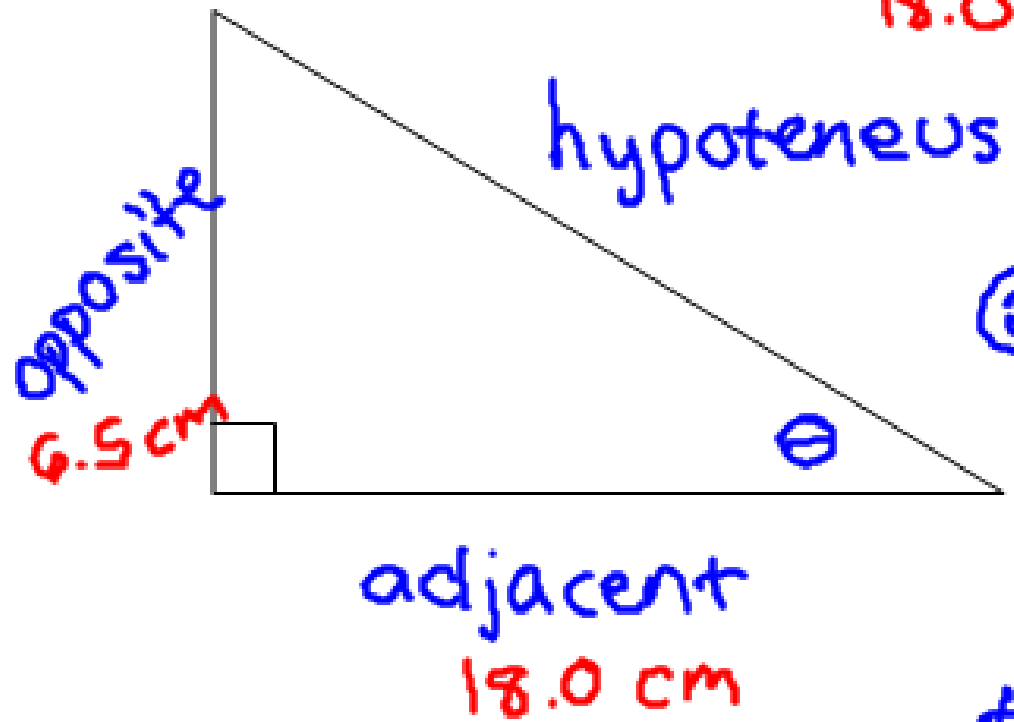
① Write tan ratio

DEG

① $\tan\theta = \frac{opp}{adj}$

MODE

$\tan\theta = \frac{6.5}{18.0}$



② Solve θ

$\tan\theta = \frac{6.5}{18.0}$

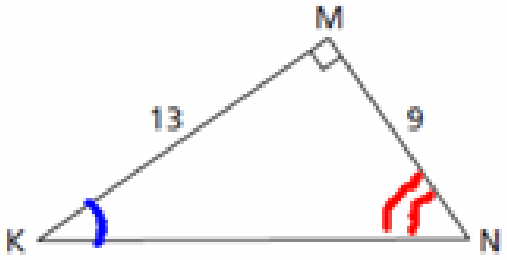
$\tan^{-1}\tan\theta = \tan^{-1}\left(\frac{6.5}{18.0}\right)$

2ND TAN

$\theta = \tan^{-1}\left(\frac{6.5}{18.0}\right)$

$\theta = 19.85^{\circ}$

2. Determine the measures of $\angle K$ and $\angle N$ to the nearest tenth of a degree.



$\tan K = \frac{opp}{adj}$

$\tan K = \frac{9}{13}$

$\angle K = \tan^{-1}\left(\frac{9}{13}\right)$

$\angle K = 34.7^\circ$

$\tan N = \frac{opp}{adj}$

$\tan N = \frac{13}{9}$

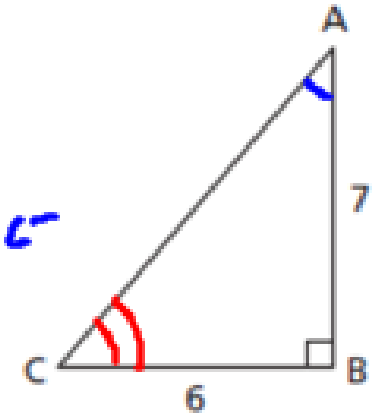
$\angle N = \tan^{-1}\left(\frac{13}{9}\right)$

$\angle N = 55.3^\circ$

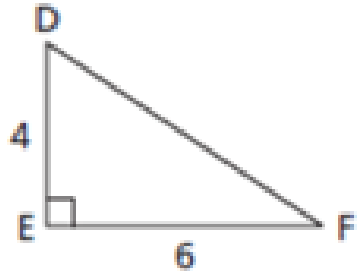
p. 75 # 3-5

3. In each triangle, write the tangent ratio for each acute angle.

a)



b)



$\tan A = \frac{6}{7}$

$\tan C = \frac{7}{6}$

4. To the nearest degree, determine the measure of $\angle X$ for each value of tan X.

a) $\tan X = 0.25$

b) $\tan X = 1.25$

c) $\tan X = 2.50$

d) $\tan X = 20$

$\tan X = 0.25$

$\angle X = \tan^{-1}(0.25)$

$\angle X = 14°$

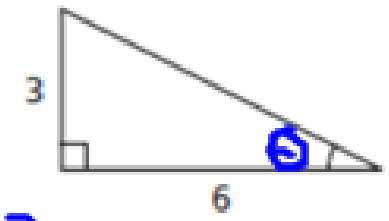
$\tan X = 2.50$

$\angle X = \tan^{-1}(2.50)$

$\angle X = 68°$

5. Determine the measure of each indicated angle to the nearest degree.

a)



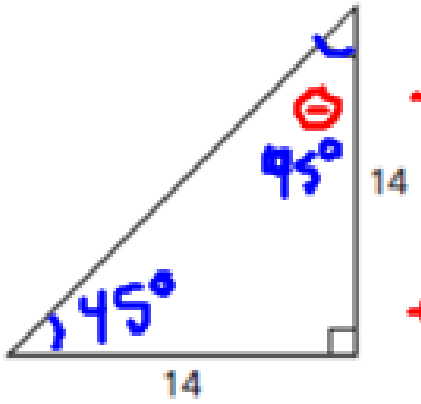
$\tan\theta = \frac{\text{opp}}{\text{adj}}$

$\tan\theta = \frac{3}{6}$

$\theta = \tan^{-1}\left(\frac{3}{6}\right)$

$\theta = 27°$

b)

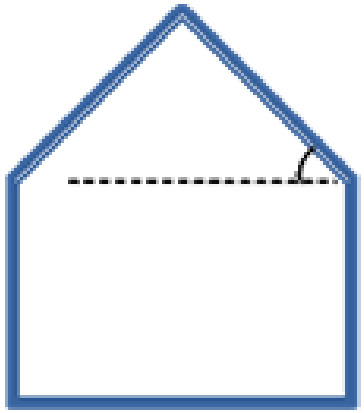


$\tan\theta = \frac{\text{opp}}{\text{adj}}$

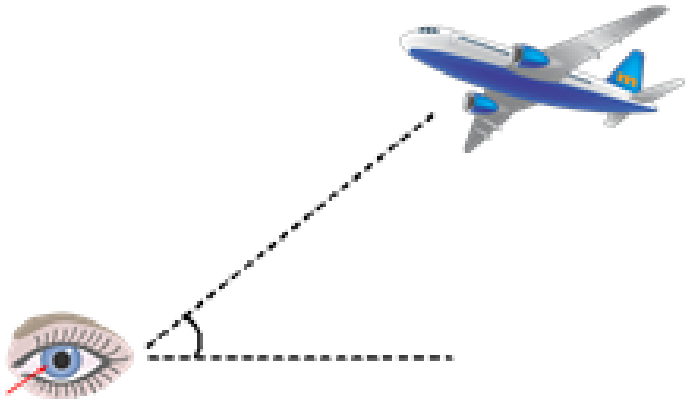
$\tan\theta = \frac{14}{14}$

$\theta = 45°$

2.1 The Tangent Ratio



The **angle of inclination** of a line or line segment is the acute angle it makes with the horizontal



The **angle of elevation** of an object above the horizontal is the angle between the horizontal and the line of sight from an observer

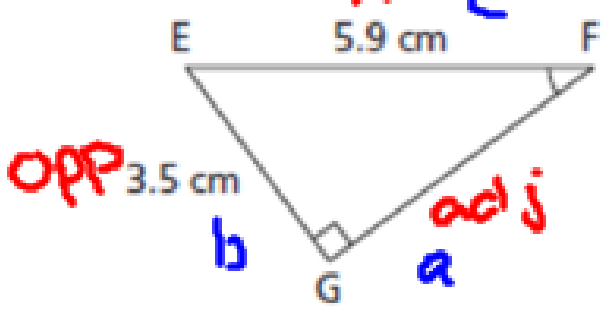
$c^2 = a^2 + b^2$

$(5.9)^2 - (3.5)^2 = a^2$

8. Determine the measure of each indicated angle to the nearest tenth of a degree. Describe your solution method.

$a = 4.7497...$ cm

a)

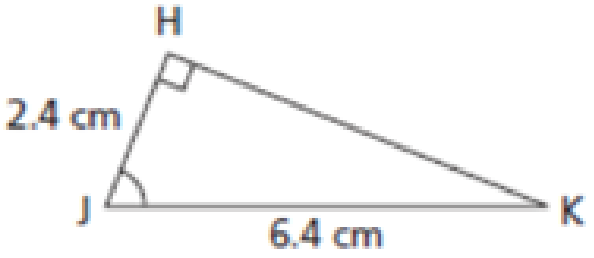


hyp c

opp b

adj a

b)



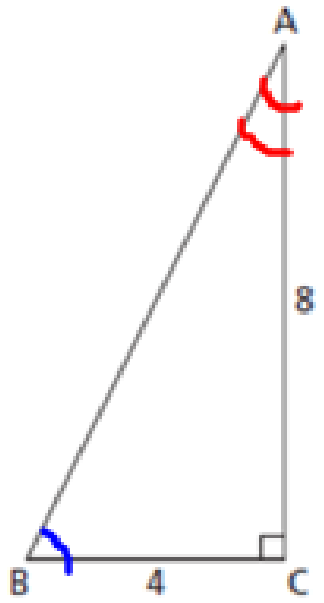
$\tan F = \frac{\text{opp}}{\text{adj}}$

$\tan F \quad \frac{3.5}{4.7497...}$

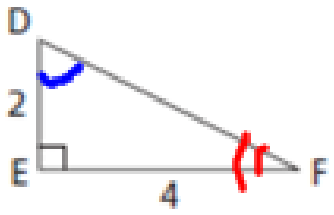
$\angle F = \tan^{-1}\left(\frac{3.5}{4.7497}\right) = 36.4^\circ$

9. a) Why are these triangles similar?

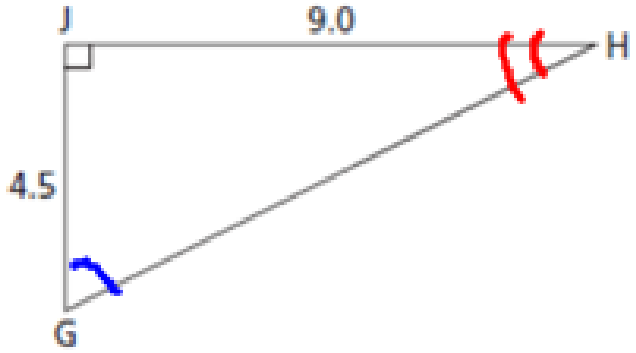
i)



ii)



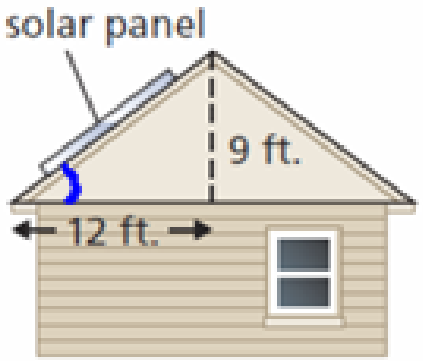
iii)

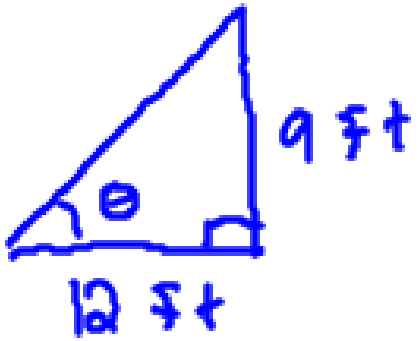


b) For each triangle in part a, determine the measures of the acute angles to the nearest tenth of a degree.

c) To complete part b, did you have to calculate the measures of all 6 acute angles? Explain.

The latitude of Fort Smith, NWT, is approximately 60°. Determine whether this design for a solar panel is the best for Fort Smith. Justify your answer.





$\tan\theta = \frac{opp}{adj}$

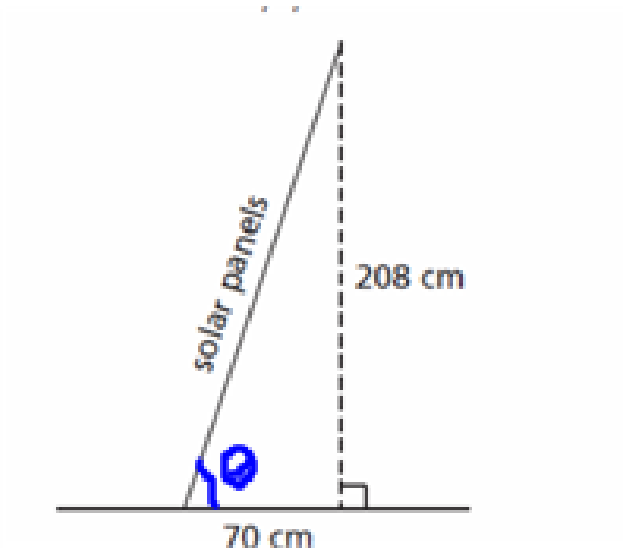
$\tan\theta = \frac{9}{12}$

$\theta = \tan^{-1}\left(\frac{9}{12}\right)$

$\theta = 36.8°$

No!

3. Clyde River on Baffin Island, Nunavut, has a latitude of approximately 70°. The diagram shows the side view of some solar panels. Determine whether this design for solar panels is the best for Clyde River. Justify your answer.



$\tan\theta = \frac{O}{A}$

$\tan\theta = \frac{208}{70}$

$\theta = \tan^{-1}\left(\frac{208}{70}\right)$

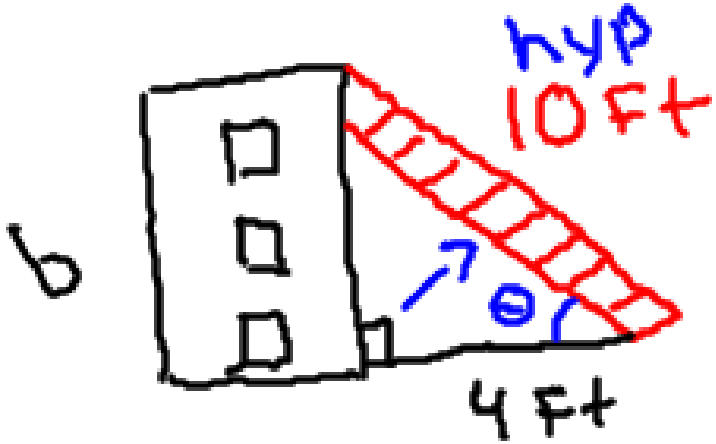
$\theta = 71°$

Yes! What a lovely design! ☺

It is a good design

A 10-ft. ladder leans against the side of a building with its base 4 ft. from the wall.

What angle, to the nearest degree, does the ladder make with the ground?

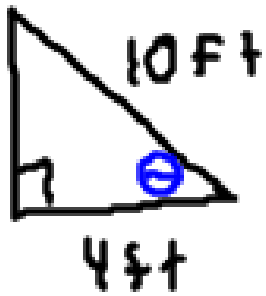


$$\tan\theta = \frac{opp}{adj}$$

$$\tan\theta = \frac{(\sqrt{84})}{4}$$

$$\theta = \tan^{-1}\left(\frac{\sqrt{84}}{4}\right)$$

$$\theta = 66^\circ$$



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

$$10^2 - 4^2 = b^2$$

$$\sqrt{84} = \sqrt{b^2}$$

$$\sqrt{84} = b$$

4. A support cable is anchored to the ground 5 m from the base of a telephone pole. The cable is 19 m long. It is attached near the top of the pole. What angle, to the nearest degree, does the cable make with the ground?

p. 75 #1 3-5, 8-11, 14, 15, 18

HWP Friday.