2.1 a)

$90° - 30° = 60°$

X

$60°$

10

$\times 2.3$

S

5

Y

30°

Z

$\times 2.5$

2

4

Similarity is proven by AAA

a)

b) NO

c)

d) $h^2 = 4^2 + 6^2$

$= 16 + 36$

$= 52$

e) AAA

$h = \sqrt{52}$

f) ✓

2.1 b

1. a) $12 = \dfrac{m}{3}$ (3)

$\boxed{36 = m}$

b) 20

c) 6

d) 9.9

2 a) $10 = \dfrac{3}{V}$

$V = \dfrac{3}{10}$

$\boxed{V = 0.3}$

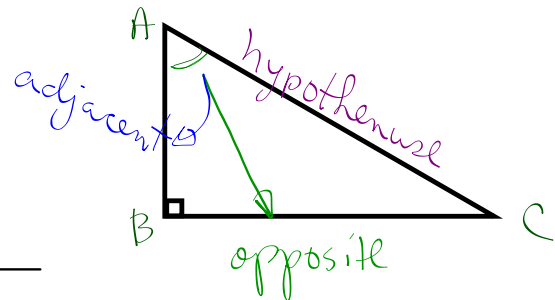b) $u = \dfrac{1}{3}$

c) $\dfrac{3.6}{6}$

$= 0.6$

d) $\dfrac{12}{0.4} = 30$

2.1 The Tangent Ratio
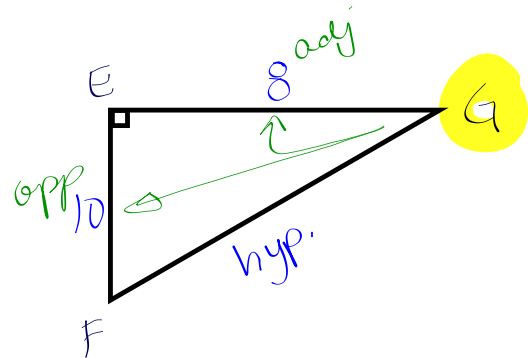
Vocabulary: <mark>adjacent</mark> means _beside (next to)_

~ reference angle

If ∠A is an acute angle in a right

triangle, then:

tangent

$\tan \angle A = $ _length of opposite side_ / _length of adjacent side_

~ reference angle

A
adjacent
hypothenuse
B
opposite
C

ex. Determine the tangent of ∠G

$$\tan \angle G = \frac{opp.}{adj.}$$

$$= \frac{10}{8}$$

$$= \frac{5}{4}$$

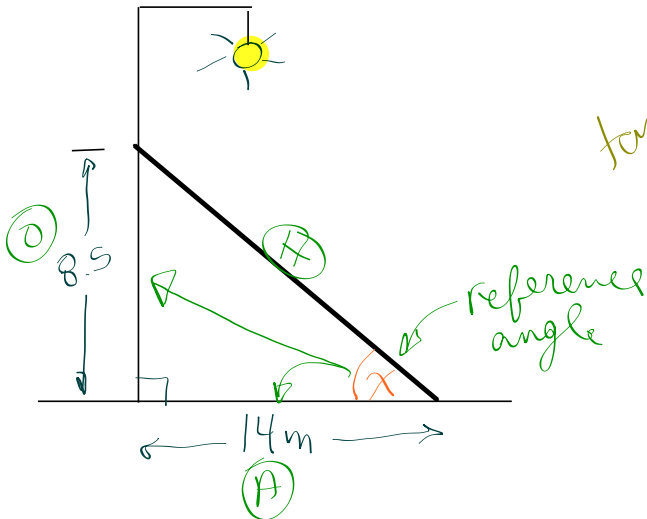E   8 adj   G
opp 10
hyp.
F

* All math operations have an _inverse_ operation that "undoes" the operation. The inverse of tan is $\tan^{-1}$ (arctan or inverse tan)

ex. Determine the measure of ∠G from the question above to the nearest degree.

$$\tan \angle G = \frac{5}{4}$$

$$\tan^{-1}(\tan \angle G) = \tan^{-1}\left(\frac{5}{4}\right)$$

$$\angle G = \tan^{-1}\left(\frac{5}{4}\right)$$

$$\boxed{\angle G \doteq 51.3°}$$

ex. One end of a cable is attached to a lamp post at a height of 8.5 meters above the ground. The other end of the cable is fixed to the ground 14 from the base of the lamp post. What is the angle between the cable and the ground?
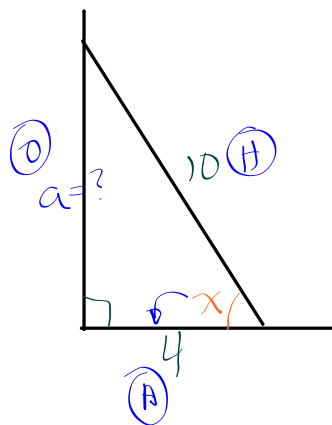
$$\tan \angle x = \frac{O}{A}$$

$$\tan^{-1}\left(\tan \angle x = \frac{8.5}{14}\right)$$

reference angle

$$\angle x = \tan^{-1}\left(\frac{8.5}{14}\right)$$

$$\boxed{\angle x \doteq 31.3°}$$

O 8.5   H   14m   A   ⟨x

ex. A 10-foot ladder leans against the side of a building with its base 4 feet from the wall. What angle does the ladder make with the ground?

$$a^2 + b^2 = c^2$$
$$a^2 + 4^2 = 10^2$$
$$a^2 + 16 = 100 \quad -16$$
$$\sqrt{a^2} = \sqrt{84}$$
$$a \doteq 9.165$$
or keep
$$\boxed{a = \sqrt{84}}$$

$$\tan \angle x = \frac{\sqrt{84}}{4} \quad \tan^{-1}$$

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

$$\angle x \doteq 66.4°$$

O a=?   10 H   4   A   ⟨x

Homefun: pg. 75 #4, 5, 7, 8, 9, 11, 13, 17, 19, 21