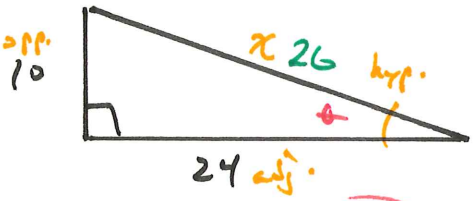
Not the hypotenuse

Always = opposite the shortest side.

1. A right triangle has legs 10 and 24. Find $\cos\theta$ where θ is the smallest angle in the triangle. Give your answer as a reduced fraction.

SOH CAH TOA



$\cos\theta = \frac{24}{x}$ ← adj. / hyp.

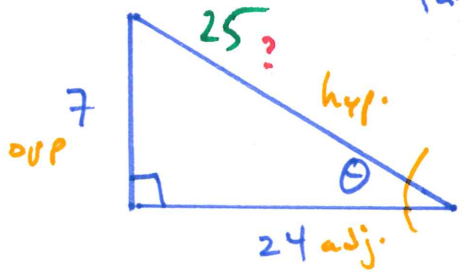
? $16^2 + 24^2 = x^2$

$676 = x^2$

$26 = x$

$\frac{24}{26}$ → reduce → $\frac{12}{13}$

2. If $\tan\theta = \frac{7}{24}$, find $\sin\theta$.



$\tan\theta = \frac{7}{24}$ ← opposite θ / ← adjacent to θ

$\sin\theta = \frac{\text{opp}}{\text{hyp}} = \frac{7}{???}$ → $\frac{7}{25}$

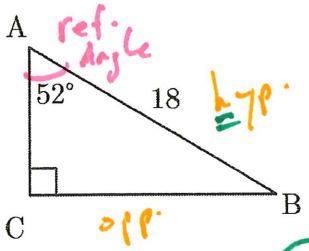
Pythagorean Th.

$7^2 + 24^2 = c^2$

$625 = c^2$

$25 = c$

3. Find the length of AC.



SOH CAH TOA

Need Adj. have Hyp...

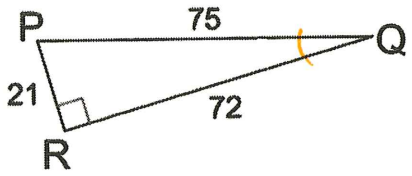
$\cos(52^\circ) = \frac{x}{18}$ ← adj. to 52° / ← hypotenuse

$0.62 = \frac{x}{18}$

use 2-3 decimal places if you round

$\frac{0.62}{1} = \frac{x}{18}$ → $x = 11.16$

4. Find the measure of each acute angle in the triangle below to the nearest degree.



Angle Q: 21 is opposite. 72 is adjacent.

$\tan Q = \frac{21}{72}$

INVERT

$\tan^{-1}\left(\frac{21}{72}\right) = Q$

$16^\circ \approx Q$

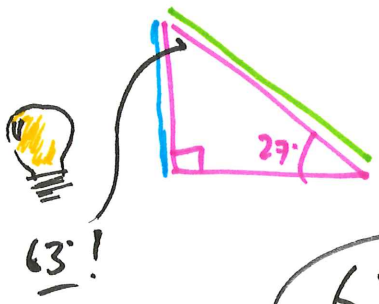
All Δ's angles sum to 180°, so...

$180 - 90 - 16$

74° ∠P

SRT-C7a

5. $\sin(27°)$ is equal to the cosine of what angle measure?

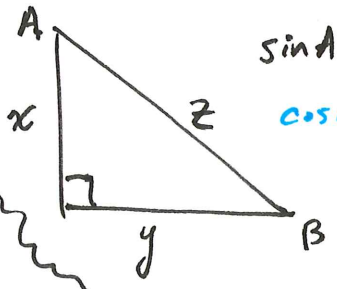


Sin 27° = ___

cos 63° = ___

63°

Concept:

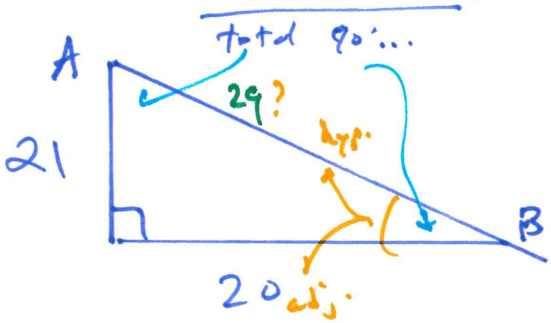


$\sin A = \frac{y}{z} = \cos B$

$\cos A = \frac{x}{z} = \sin B$

$\angle A + \angle B = 90°$

6. A and B are complementary angles. If $\tan A = \frac{20}{21}$, find $\cos B$.



total 90°...

$\tan A = \frac{20}{21}$ opposite A / adjacent to A

$\cos B = ?$

$= \frac{\text{adj to B}}{\text{hyp.}}$

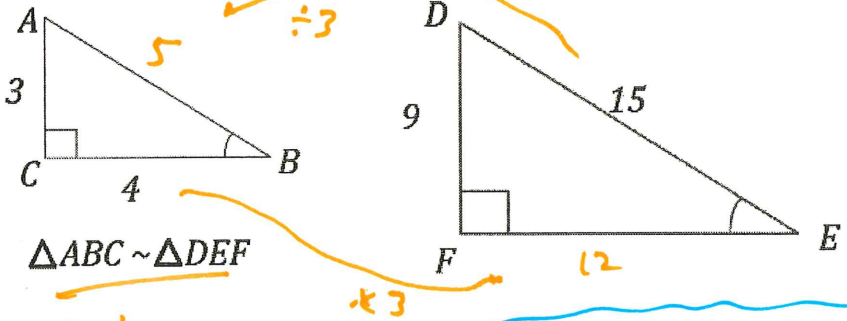
$= \frac{20}{?}$

$\frac{20}{29}$

$21^2 + 20^2 = c^2$

$841 = c^2 \rightarrow c = 29$

7. Which of the following is equivalent to $\sin E$? Select ALL that apply.



$\triangle ABC \sim \triangle DEF$

÷3

×3

Scale factor?

$\frac{DF}{AC} = \frac{9}{3} = 3$

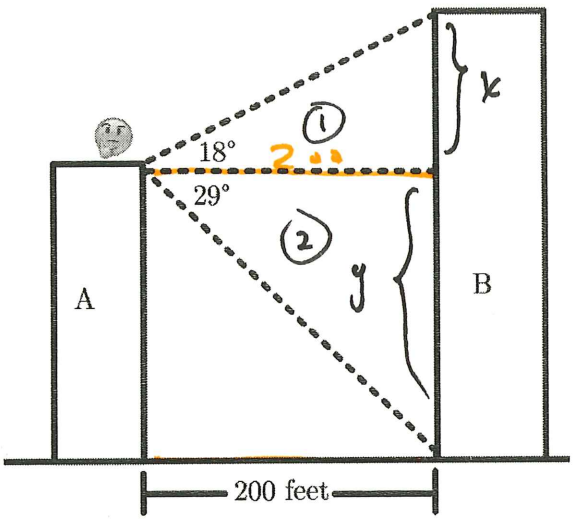
- [x] cos D 9/15
- [ ] sin D 12/15
- [ ] tan A 4/3
- [x] sin B 3/5
- [ ] tan E 9/12
- [x] cos A 3/5
- [ ] sin A 4/5

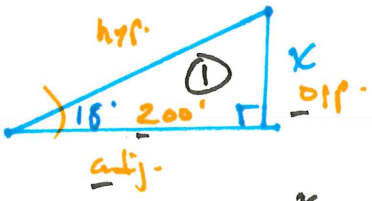
$\sin E = \frac{9}{15}$ reduce $\frac{3}{5}$

SOHCAHTOA

SRT-C8a

8. A person is at the top of a building and uses a clinometer to measure the angles of elevation and depression to the top and bottom of another, taller building located 200 feet away [see figure below]. How tall, to the nearest foot, is each building?

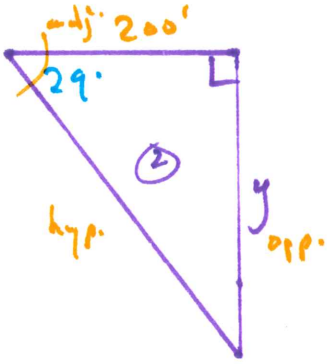




$\tan(18^\circ) = \frac{x}{200}$

$0.32 = \frac{x}{200}$

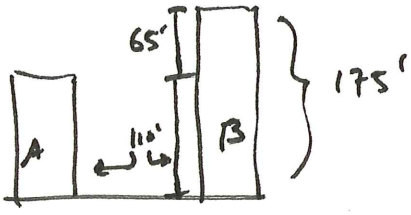
$65 = x$



$\tan(29^\circ) = \frac{y}{200}$

$0.55 = \frac{y}{200}$

$110 = y$

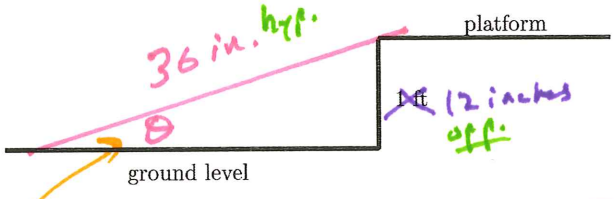


Building A: 110'
Building B: 175'

9. A 36-inch long plywood board is being used as a makeshift ramp to reach an elevated platform that is 1 foot above the ground [see below]. If the angle the board makes with the ground is 20° or greater, it will not be safe to use. Is the ramp safe to use? Show the calculations that lead to your conclusion.

!!!

1 foot = 12 inches



Is this $\geq 20^\circ$?

$\sin\theta = \frac{12}{36}$

$\sin^{-1}\left(\frac{12}{36}\right) = \theta$

$19.47^\circ \approx \theta$

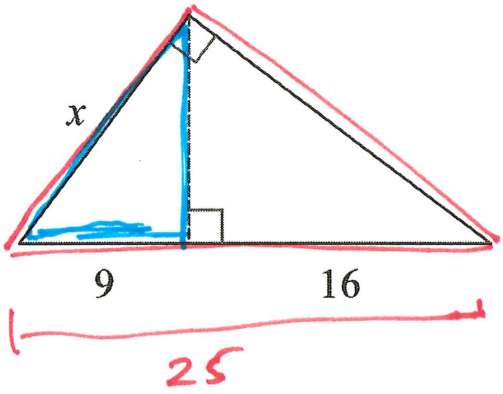
very slightly less than 20°

So, it is safe to use.

SRT-B5d

Find the value of x.

10.



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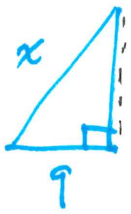


~ large

~ medium ??

Proportions:

$$\frac{x}{25} = \frac{9}{x}$$

$x^2 = 225$

$x = 15$

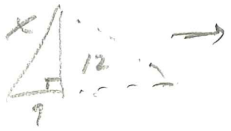
All. method for #10.

$h^2 = c \cdot d$

$h^2 = 9 \cdot 16$

$h^2 = 144$

$h = 12$

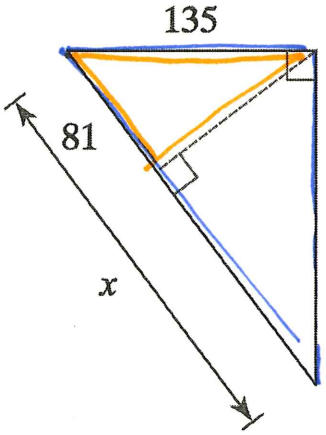


$9^2 + 12^2 = x^2$

$225 = x^2$

$15 = x$

11.



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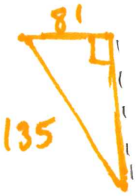

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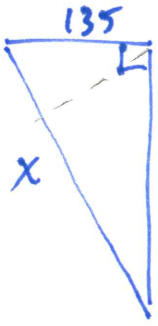

~ medium ??

Proportion

$$\frac{81}{135} = \frac{135}{x}$$

$81x = 18{,}225$ ÷ 81

$x = 225$