Trig Word Problems

Use a trig table to evaluate.

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| **EXAMPLE**Approximately how long is the building’s shadow (round to the nearest tenth)?$$\uparrow shadow=adj=x $$*Set up the trig ratio first…**H: ???, O: 120, A: x* $\rightarrow $ *TOA!*$$\tan(\left(40˚\right))=\frac{120}{x}$$$$x=\frac{120}{\tan(\left(40˚\right))}$$$$x=\frac{120}{0.8391}$$$$x=143.010…$$$$$$ | 1. Approximately how long is the building’s shadow (round to the nearest tenth)? | 2. Approximately how long is the building’s shadow (round to the nearest tenth)? |
| **EXAMPLE**A rope is tied to the top of a tree and anchored to the ground 10 ft away. Approximately how long is the rope (round to the nearest tenth)?*H: x, O: ???, A: 10* $\rightarrow $ *CAH!*$$\cos(\left(25˚\right))=\frac{10}{x}$$$$x=\frac{10}{\cos(\left(25˚\right))}$$$$x=\frac{10}{0.9063}$$$$x=11.0338…$$$$$$ | 3. A rope is tied to the top of a 15-ft tree and anchored to the ground. Approximately how long is the rope (round to the nearest tenth)? | 4. A rope is tied to the top of a tree and anchored to the ground 30 ft away. Approximately how tall is the tree (round to the nearest tenth)? |
| **EXAMPLE**Approximately how long is the person’s shadow (round to the nearest tenth)?$$\uparrow shadow=adj=x $$*H: ???, O: 5.2, A: x* $\rightarrow $ *TOA!*$$\tan(\left(20˚\right))=\frac{5.2}{x}$$$$x=\frac{5.2}{\tan(\left(20˚\right))}$$$$x=\frac{5.2}{0.3640}$$$$x=14.285…$$$$$$ | 5. Approximately how long is the person’s shadow (round to the nearest tenth)? | 6. Approximately how long is the person’s shadow (round to the nearest tenth)? |
| **EXAMPLE**A ranger spots a fire from the top of a watchtower that is 150 ft tall. If the angle of depression from the top of the watchtower to the fire is 42˚, what is the horizontal distance between them? Round to the nearest foot.*H: ???, O: 150, A: x* $\rightarrow $ *TOA!*$$\tan(\left(42˚\right))=\frac{150}{x}$$$$x=\frac{150}{\tan(\left(42˚\right))}$$$$x=\frac{150}{0.9004}$$$$x=166.592…$$$$$$ | 7. A ranger spots a fire from the top of a watchtower that is 400 ft tall. If the angle of depression from the top of the watchtower to the fire is 37˚, what is the horizontal distance between them? Round to the nearest foot. | 8. A ranger spots a fire from the top of a watchtower that is 250 ft tall. If the angle of depression from the top of the watchtower to the fire is 34˚, what is the horizontal distance between them? Round to the nearest foot. |
| **EXAMPLE**In a triangle where *P* is a right angle, *PQ* = 24, and *QR* = 25. Determine $\cos(R)$ to the nearest hundredth. *First, draw it out. It doesn’t matter what it looks like, so long as it’s labeled correctly: P is a 90˚ angle, and the other two angles are Q & R.* *H: 25, O: 24, A: ???* *Normally, I’d say, “use SOH,” but the problem* ***asks for cosR****, which means I need* ***adj*** *and* ***hyp.*** ***Before I start, I’ll use*** *the* ***Pythagorean Theorem*** *to find adj.* $$a^{2}+b^{2}=c^{2} $$$$a^{2}+576=625 $$$$a^{2}=49$$$$\sqrt{a^{2}}=\sqrt{49}$$$$ a=7 $$*H: 25, O: 24, A: 7* $\rightarrow find \cos(R)$*.*$$\cos(R)=\frac{adj}{hyp}$$$$\cos(R)=\frac{7}{25}$$$$\cos(R)=$$*The problem asked for what* $\cos(R)$ *equals. You found it. Stop.* | 9. In a triangle where *M* is a right angle, *LM* = 5, and *LN* = 13. Determine $\tan(N)$ to the nearest hundredth.  | 10. In a triangle where *F* is a right angle, *DF* = 6, and *EF* = 8. Determine $\sin(D)$ to the nearest hundredth.  |