

Using Trig Ratios to Find the Missing Side or Angle of a Right Triangle

1. TOA $\tan(25) = \frac{x}{12}$
 $x = 12 \tan(25)$
 $x = 5.6$

A right-angled triangle with a right angle at the bottom-left. The angle at the bottom-right is 25°. The horizontal side (adjacent) is labeled 12. The vertical side (opposite) is labeled x. The hypotenuse is labeled H. The letters TOA are written above the triangle.

2. CAH $\cos(31) = \frac{12}{x}$
 $12 = \cos(31) x$
 $x = 14$

A right-angled triangle with a right angle at the bottom-left. The angle at the bottom-right is 31°. The horizontal side (adjacent) is labeled 12. The hypotenuse is labeled x. The vertical side is labeled H. The letters CAH are written above the triangle.

3. SOH $\sin(44) = \frac{x}{48}$
 $x = 48 \sin(44)$
 $x = 33.34$

A right-angled triangle with a right angle at the bottom-right. The angle at the bottom-left is 44°. The hypotenuse is labeled 48. The vertical side (opposite) is labeled x. The horizontal side is labeled A. The letters SOH are written below the triangle.

4. TOA $\tan(67) = \frac{18}{x}$
 $18 = \tan(67) x$
 $7.64 = x$

A right-angled triangle with a right angle at the bottom-left. The angle at the top-left is 67°. The vertical side (opposite) is labeled 18. The horizontal side (adjacent) is labeled x. The hypotenuse is labeled H. The letters TOA are written below the triangle.

5. TOA $\tan(x) = \frac{30}{20}$
 $x = \tan^{-1}\left(\frac{30}{20}\right)$
 $x = 56.31^\circ$

A right-angled triangle with a right angle at the bottom-left. The angle at the top-left is x. The vertical side (opposite) is labeled 30. The horizontal side (adjacent) is labeled 20. The hypotenuse is labeled H. The letters TOA are written below the triangle.

6. SOH $\sin(x) = \frac{14}{26}$
 $x = \sin^{-1}\left(\frac{14}{26}\right)$
 $x = 32.58^\circ$

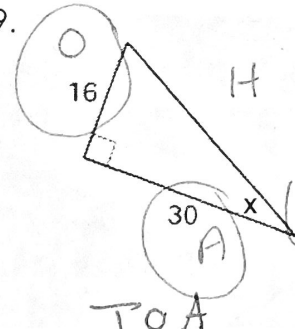
A right-angled triangle with a right angle at the top-right. The angle at the top-left is x. The hypotenuse is labeled 26. The vertical side (opposite) is labeled 14. The horizontal side is labeled A. The letters SOH are written below the triangle.

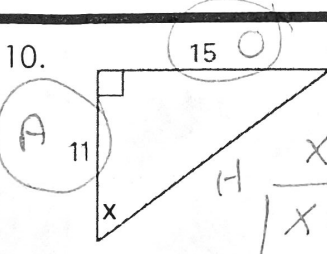
7. CAH $\cos(x) = \frac{10}{16}$
 $x = \cos^{-1}\left(\frac{10}{16}\right)$
 $x = 51.32^\circ$

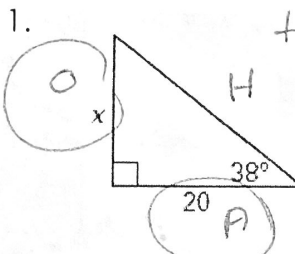
A right-angled triangle with a right angle at the top-right. The angle at the top-left is x. The hypotenuse is labeled 16. The horizontal side (adjacent) is labeled 10. The vertical side is labeled H. The letters CAH are written below the triangle.

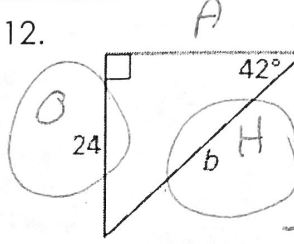
8. SOH $\sin(x) = \frac{7}{11}$
 $x = \sin^{-1}\left(\frac{7}{11}\right)$
 $x = 39.52^\circ$

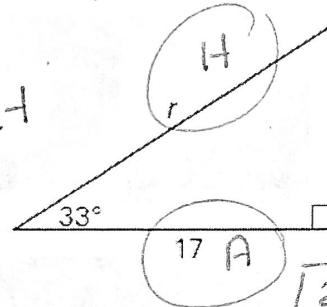
A right-angled triangle with a right angle at the bottom-left. The angle at the top-left is x. The hypotenuse is labeled 11. The vertical side (opposite) is labeled 7. The horizontal side is labeled A. The letters SOH are written below the triangle.

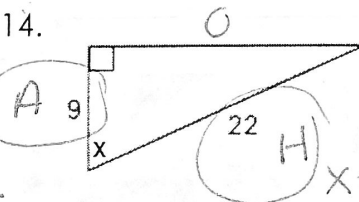
9.  $\tan(x) = \frac{16}{30}$
 $x = \tan^{-1}\left(\frac{16}{30}\right)$
 $x = 28.07^\circ$
 TOA

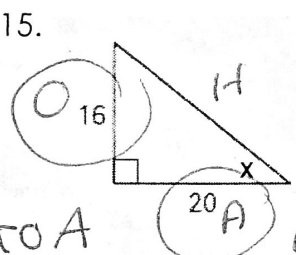
10.  $\tan(x) = \frac{15}{11}$
 $x = \tan^{-1}\left(\frac{15}{11}\right)$
 $x = 53.75^\circ$
 TOA

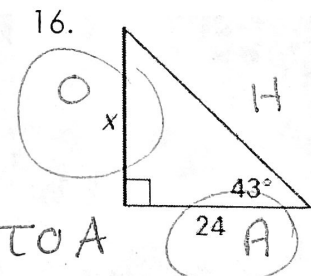
11.  $\tan(38) = \frac{x}{20}$
 $x = 20 \tan(38)$
 $x = 15.63$
 TOA

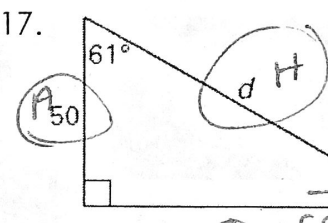
12.  $\sin(42) = \frac{24}{b}$
 $24 = \frac{\sin(42)b}{\sin(42)}$
 $35.87 = b$
 SOH

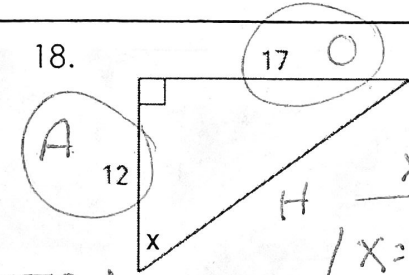
13.  $\cos(33) = \frac{17}{r}$
 $17 = \frac{\cos(33)r}{\cos(33)}$
 $20.27 = r$
 CAH

14.  $\cos(x) = \frac{9}{22}$
 $x = \cos^{-1}\left(\frac{9}{22}\right)$
 $x = 65.85^\circ$
 CAH

15.  $\tan(x) = \frac{16}{20}$
 $x = \tan^{-1}\left(\frac{16}{20}\right)$
 $x = 38.66^\circ$
 TOA

16.  $\tan(43) = \frac{x}{24}$
 $x = 24 \tan(43)$
 $x = 22.38$
 TOA

17.  $\cos(61) = \frac{50}{d}$
 $50 = \frac{\cos(61)d}{\cos(61)}$
 $103.13 = d$
 CAH

18.  $\tan(x) = \frac{17}{12}$
 $x = \tan^{-1}\left(\frac{17}{12}\right)$
 $x = 54.78^\circ$
 TOA