

WALT use the trig ratio to find angles

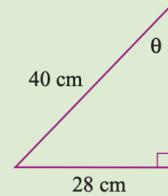
Success Criteria I know my trig formulas and I can identify sides. I know how to use the inverse operation on a calculator

[View the video first](#)

Using trigonometry to find angles

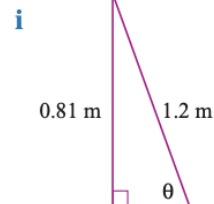
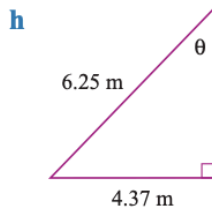
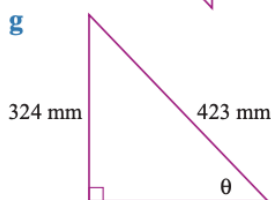
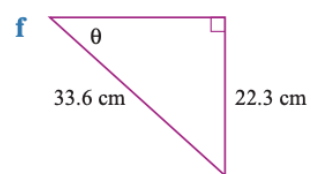
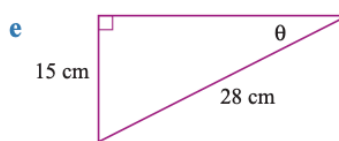
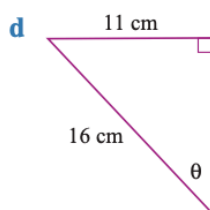
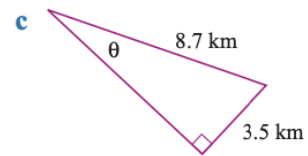
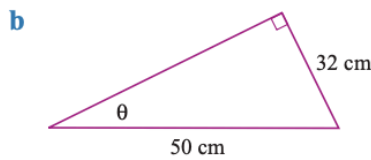
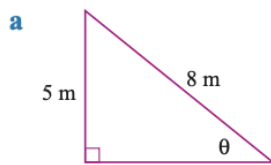
EXAMPLE 1

Use the sine ratio to find the value of θ to the nearest minute.

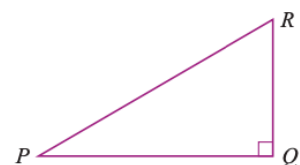


Solve	Think	Apply
$\sin \theta = \frac{\text{opposite}}{\text{hypotenuse}}$ $= \frac{28}{40}$ $\therefore \theta = 44^{\circ}25'37.21\dots''$ $\approx 44^{\circ}26'$	<p>The side opposite θ and the hypotenuse are given.</p> 	<p>Press SHIFT before sin to obtain an angle.</p>

1 Using the sine ratio, find the value of θ to the nearest minute.



2 RQ is half as long as PR . Using the sine ratio, find the value of angle RPQ .



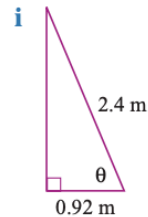
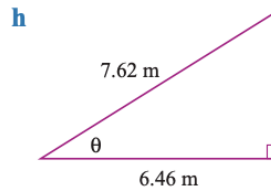
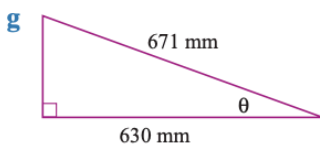
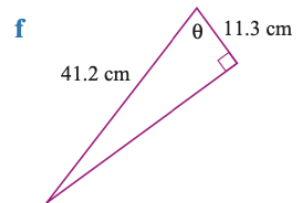
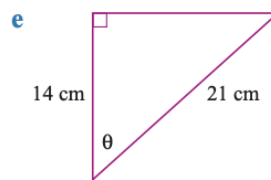
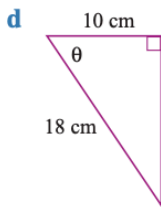
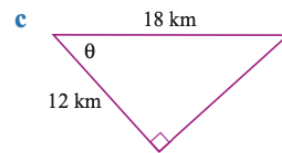
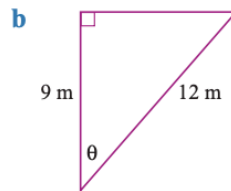
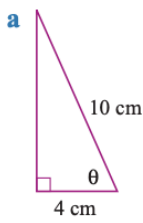
EXAMPLE 2

Use the cosine ratio to find the value of θ to the nearest minute.

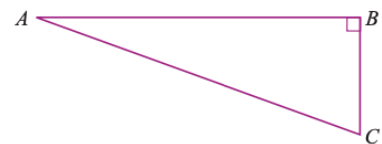


Solve	Think	Apply
$\cos \theta = \frac{\text{adjacent}}{\text{hypotenuse}}$ $= \frac{4}{12}$ $\therefore \theta = 70^{\circ}31'43.60\dots''$ $\approx 70^{\circ}32'$	<p>The side adjacent to θ and the hypotenuse are given.</p>	<p>Press SHIFT before cos to obtain an angle.</p>

3 Using the cosine ratio, find the value of θ to the nearest minute.

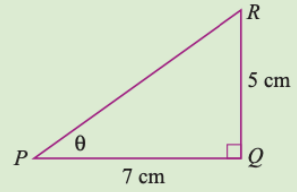


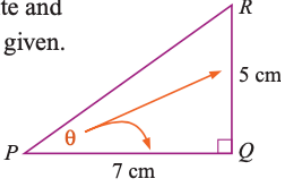
4 AC is three times longer than BC . Using the cosine ratio, find the value of angle BCA to the nearest minute.



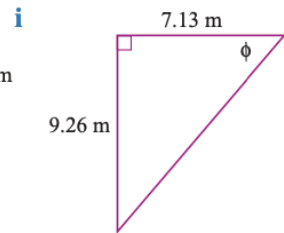
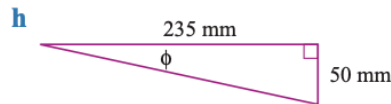
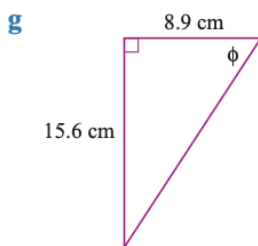
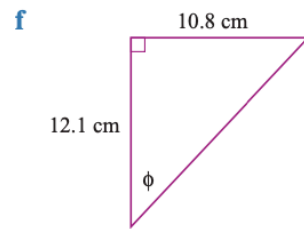
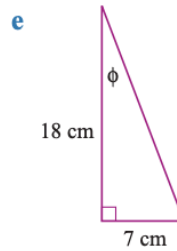
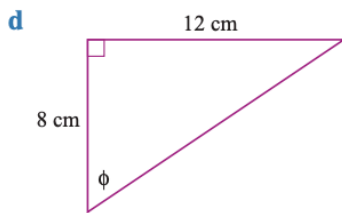
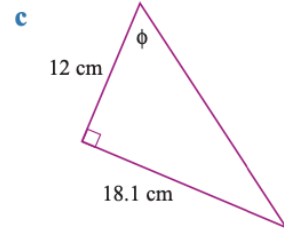
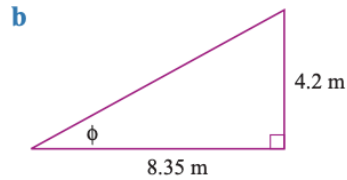
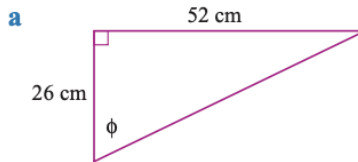
EXAMPLE 3

Use the tangent ratio to find the value of θ to the nearest minute.



Solve	Think	Apply
$\tan \theta = \frac{\text{opposite}}{\text{adjacent}}$ $= \frac{5}{7}$ $\therefore \theta = 35^{\circ}32'15.64\dots''$ $\approx 35^{\circ}32'$	<p>The sides opposite and adjacent to θ are given.</p>  <p>SHIFT tan () 5 \div 7) = DMS</p>	<p>Press SHIFT before tan to obtain an angle.</p>

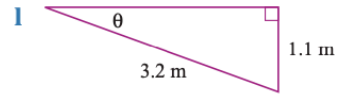
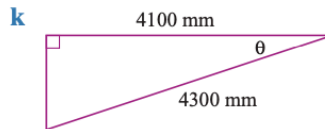
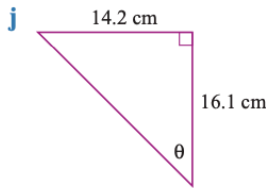
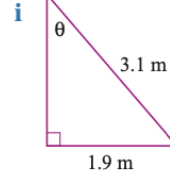
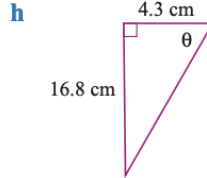
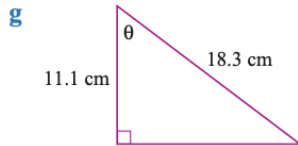
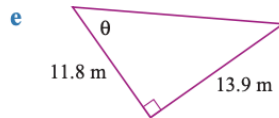
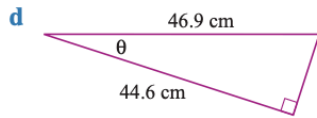
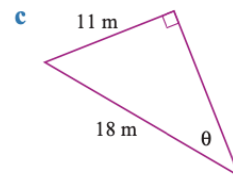
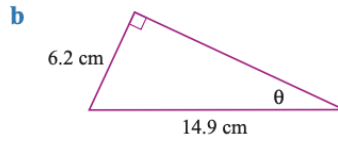
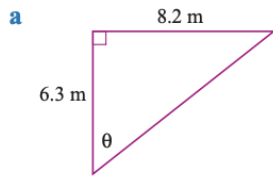
5 Using the tangent ratio, find the value of ϕ to the nearest minute.



6 The ratio of JK to LK is 5 to 2. Using the tangent ratio, find the value of angle JLK to the nearest minute.



7 Use the sine, cosine or tangent ratios to find each unknown angle to the nearest minute.



Check your answers

1 a $38^{\circ}41'$

b $39^{\circ}48'$

c $23^{\circ}43'$

d $43^{\circ}26'$

e $32^{\circ}24'$

f $41^{\circ}35'$

g $50^{\circ}0'$

h $44^{\circ}22'$

i $42^{\circ}27'$

2 30° (exact)

3 a $66^{\circ}25'$

b $41^{\circ}25'$

c $48^{\circ}11'$

d $56^{\circ}15'$

e $48^{\circ}11'$

f $74^{\circ}5'$

g $20^{\circ}8'$

h $32^{\circ}2'$

i $67^{\circ}28'$

4 $70^{\circ}32'$

5 a $63^{\circ}26'$

b $26^{\circ}42'$

c $56^{\circ}27'$

d $56^{\circ}19'$

e $21^{\circ}15'$

f $41^{\circ}45'$

g $60^{\circ}18'$

h $12^{\circ}1'$

i $52^{\circ}24'$

6 $68^{\circ}12'$

7 a $52^{\circ}28'$

b $24^{\circ}35'$

c $37^{\circ}40'$

d $18^{\circ}1'$

e $49^{\circ}40'$

f $17^{\circ}51'$

g $52^{\circ}40'$

h $75^{\circ}39'$

i $37^{\circ}48'$

j $41^{\circ}25'$

k $17^{\circ}33'$

l $20^{\circ}6'$

