WALT Identify sides of a right angle triangle

Success Criteria - I can identify hypotenuse and read the sign theta

I am able to list the rules for Sine, Cosine and Tangent

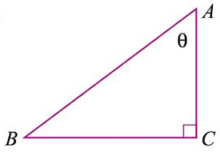
1 For each triangle below, name the:

i hypotenuse

ii side opposite the angle marked θ

iii side adjacent to the angle marked θ.

a



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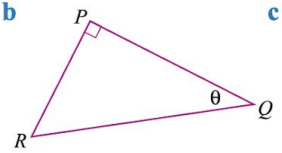

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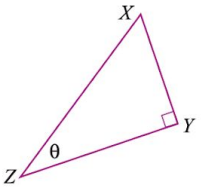

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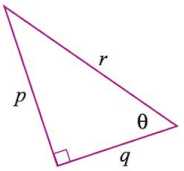

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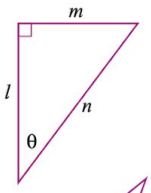

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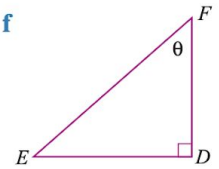

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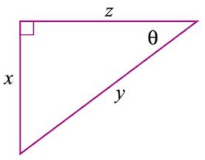

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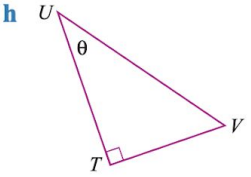
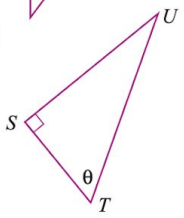


i



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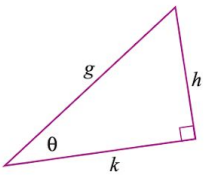

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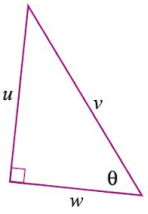

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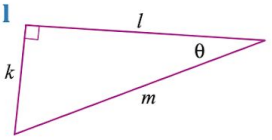
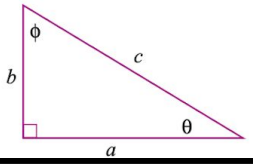


2 For the triangle shown, name the side:

a opposite the angle marked θ **b** opposite the angle marked ϕ

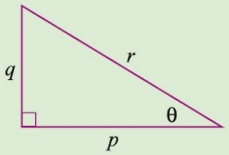
c adjacent to the angle marked θ **d** adjacent to the angle marked ϕ



EXAMPLE 2

Using the given triangle, write expressions to complete the table for θ.

opposite / adjacent	opposite / hypotenuse	adjacent / hypotenuse



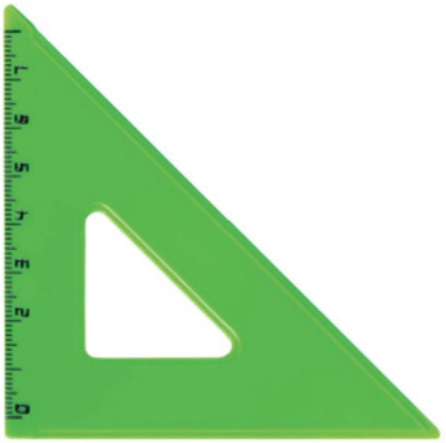
Solve			Think	Apply
$\frac{\text{opposite}}{\text{adjacent}}$	$\frac{\text{opposite}}{\text{hypotenuse}}$	$\frac{\text{adjacent}}{\text{hypotenuse}}$	The hypotenuse is r, the side opposite the angle marked θ is q, and the side adjacent to θ is p.	The opposite and the adjacent sides are relative to the non-right angle chosen.
$\frac{q}{p}$	$\frac{q}{r}$	$\frac{p}{r}$		

3 Complete this table for θ for each of the triangles in question **1**.

$\frac{\text{opposite}}{\text{adjacent}}$	$\frac{\text{opposite}}{\text{hypotenuse}}$	$\frac{\text{adjacent}}{\text{hypotenuse}}$

The trigonometric ratios

The ratios from Example 2 are given names.



- The ratio $\frac{\text{opposite}}{\text{adjacent}}$ is the **tangent** of the angle marked θ.

  This is written as **tan** θ = $\frac{\textbf{opposite}}{\textbf{adjacent}}$.

- The ratio $\frac{\text{opposite}}{\text{hypotenuse}}$ is the **sine** of the angle marked θ.

  This is written as **sin** θ = $\frac{\textbf{opposite}}{\textbf{hypotenuse}}$.

- The ratio $\frac{\text{adjacent}}{\text{hypotenuse}}$ is the **cosine** of the angle marked θ.

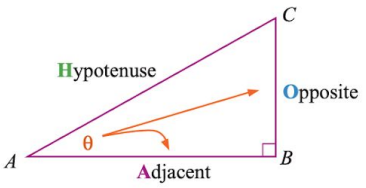
  This is written as **cos** θ = $\frac{\textbf{adjacent}}{\textbf{hypotenuse}}$.

The trigonometric ratios can be remembered using a mnemonic: SOH CAH TOA.

SOH Sin θ = $\frac{\text{Opposite}}{\text{Hypotenuse}}$

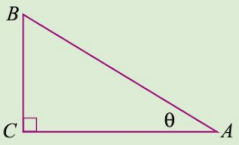
CAH Cos θ = $\frac{\text{Adjacent}}{\text{Hypotenuse}}$

TOA Tan θ = $\frac{\text{Opposite}}{\text{Adjacent}}$



EXAMPLE 3

In triangle ABC, find expressions for tan θ, cos θ, and sin θ.

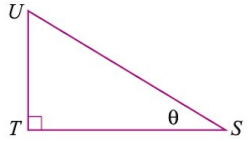


Solve	Think	Apply
$\tan\theta = \frac{BC}{AC}$ $\sin\theta = \frac{BC}{AB}$ $\cos\theta = \frac{AC}{AB}$	$\tan\theta = \frac{\text{opposite}}{\text{adjacent}}$ $\sin\theta = \frac{\text{opposite}}{\text{hypotenuse}}$ $\cos\theta = \frac{\text{adjacent}}{\text{hypotenuse}}$	Locate the hypotenuse opposite the right angle. Identify the opposite and adjacent sides relative to the chosen angle.

4 For each triangle, find an expression for:

i $\tan\theta$ **ii** $\sin\theta$ **iii** $\cos\theta$

a



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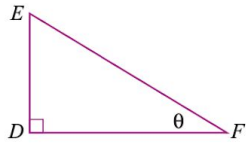

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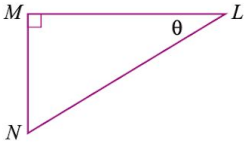

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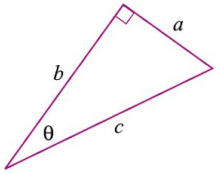

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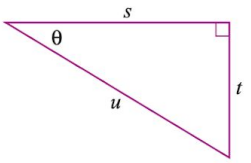

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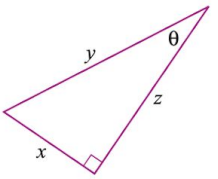

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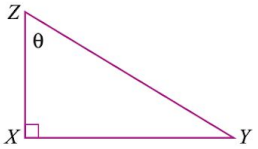

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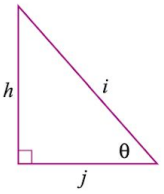
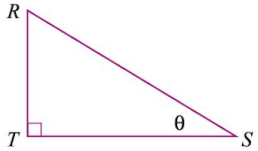


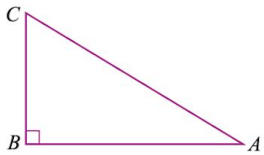
i



5 For each triangle, find an expression for:

i $\sin A$ **ii** $\cos A$ **iii** $\tan A$

a



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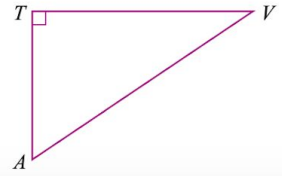

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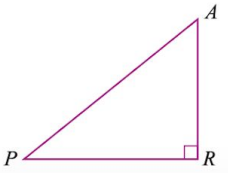

Check your answers

Exercise 8B

1

a	**i** AB	**ii** BC	**iii** AC
b	**i** RQ	**ii** PR	**iii** PQ
c	**i** XZ	**ii** XY	**iii** ZY
d	**i** r	**ii** p	**iii** q
e	**i** n	**ii** m	**iii** l
f	**i** EF	**ii** ED	**iii** FD
g	**i** y	**ii** x	**iii** z
h	**i** UV	**ii** TV	**iii** UT
i	**i** TU	**ii** SU	**iii** ST
j	**i** g	**ii** h	**iii** k
k	**i** v	**ii** u	**iii** w
l	**i** m	**ii** k	**iii** l

2 **a** b **b** a **c** a **d** b

3

	$\frac{\text{opposite}}{\text{adjacent}}$	$\frac{\text{opposite}}{\text{hypotenuse}}$	$\frac{\text{adjacent}}{\text{hypotenuse}}$
a	$\frac{BC}{AC}$	$\frac{BC}{AB}$	$\frac{AC}{AB}$
b	$\frac{PR}{PQ}$	$\frac{PR}{RQ}$	$\frac{PQ}{RQ}$
c	$\frac{XY}{ZY}$	$\frac{XY}{XZ}$	$\frac{ZY}{XZ}$
d	$\frac{p}{q}$	$\frac{p}{r}$	$\frac{q}{r}$
e	$\frac{m}{l}$	$\frac{m}{n}$	$\frac{l}{n}$
f	$\frac{ED}{FD}$	$\frac{ED}{EF}$	$\frac{FD}{EF}$
g	$\frac{x}{z}$	$\frac{x}{y}$	$\frac{z}{y}$
h	$\frac{TV}{UT}$	$\frac{TV}{UV}$	$\frac{UT}{UV}$
i	$\frac{SU}{ST}$	$\frac{SU}{TU}$	$\frac{ST}{TU}$
j	$\frac{h}{k}$	$\frac{h}{g}$	$\frac{k}{g}$
k	$\frac{u}{w}$	$\frac{u}{v}$	$\frac{w}{v}$
l	$\frac{k}{l}$	$\frac{k}{m}$	$\frac{l}{m}$

4 **a** **i** $\frac{UT}{TS}$ **ii** $\frac{UT}{US}$ **iii** $\frac{TS}{US}$

b **i** $\frac{ED}{DF}$ **ii** $\frac{ED}{EF}$ **iii** $\frac{DF}{EF}$

c **i** $\frac{MN}{ML}$ **ii** $\frac{MN}{LN}$ **iii** $\frac{LM}{LN}$

d **i** $\frac{a}{b}$ **ii** $\frac{a}{c}$ **iii** $\frac{b}{c}$

e **i** $\frac{t}{s}$ **ii** $\frac{t}{u}$ **iii** $\frac{s}{u}$

f **i** $\frac{x}{z}$ **ii** $\frac{x}{y}$ **iii** $\frac{z}{y}$

g **i** $\frac{XY}{XZ}$ **ii** $\frac{XY}{YZ}$ **iii** $\frac{XZ}{YZ}$

h **i** $\frac{h}{j}$ **ii** $\frac{h}{i}$ **iii** $\frac{j}{i}$

i **i** $\frac{RT}{ST}$ **ii** $\frac{RT}{RS}$ **iii** $\frac{ST}{RS}$

5 **a** **i** $\frac{BC}{CA}$ **ii** $\frac{BA}{AC}$ **iii** $\frac{CB}{BA}$

b **i** $\frac{TV}{AV}$ **ii** $\frac{AT}{AV}$ **iii** $\frac{TV}{TA}$

c **i** $\frac{PR}{AP}$ **ii** $\frac{AR}{AP}$ **iii** $\frac{PR}{AR}$