



Colin and Coco's Deliberate Practice

Year 6 Unit 6

Properties of Shapes
Angles





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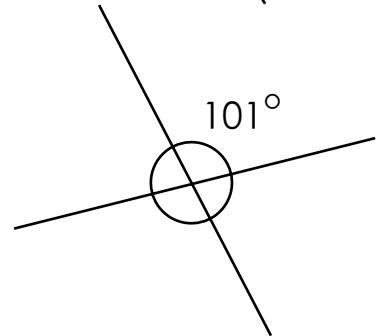
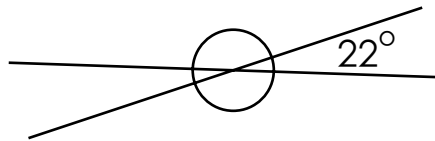
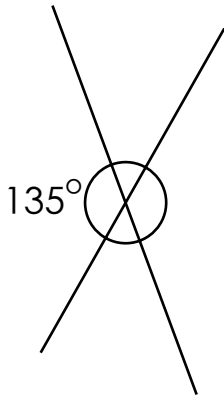
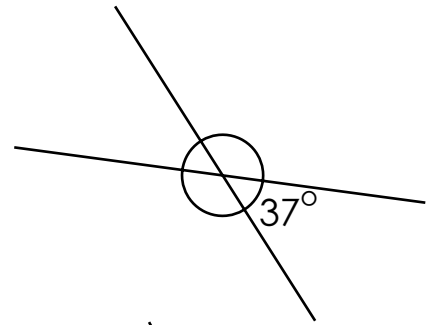
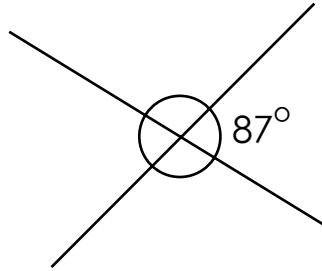
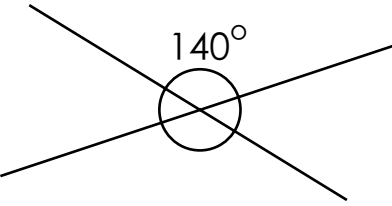
This pack of deliberate practice is designed to be used flexibly to secure the manageable steps of this unit.

The table below indicates which activities are linked to which manageable steps.

	Do It	Challenge It	Play It
Find missing angles where they meet at a point		1	
Find missing angles where they meet on a straight line			1
Find missing angles where they are vertically opposite	1		
Find unknown angles in a triangle	2	2	
Find unknown angles in an isosceles triangle when only one angle is known		2	2
Find unknown angles in a quadrilateral	3		3
Find unknown angles in regular polygons		3	



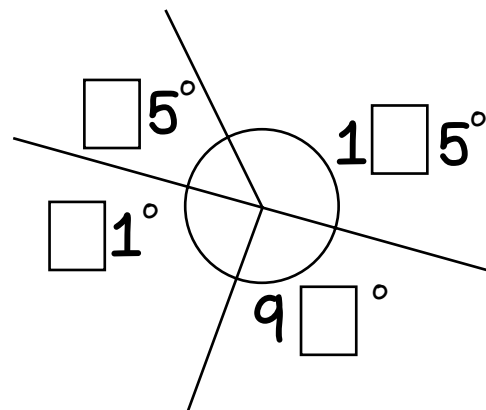
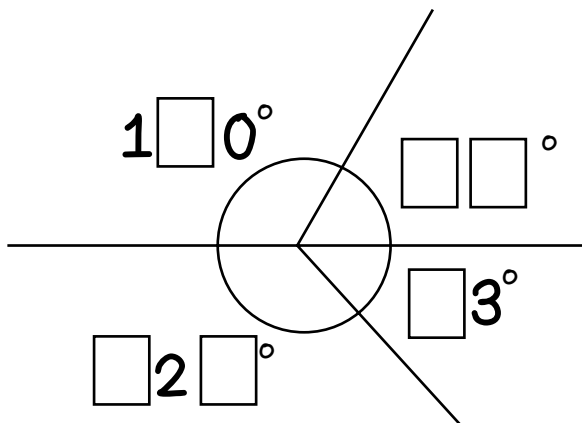
Calculate all the missing angles:
Not drawn to scale.



Do It 1

Challenge It 1

Find the missing digits.
Complete them in several different ways.



Complete them both together using the digits 0 - 9 once each.



Angles on a Straight Line Game

Play It 1

You need:

1 - 6 dice

To play:

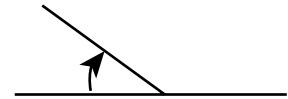
Player 1 draws a straight line and marks the point at which the angles will meet.
Player 1 throws the dice twice, makes a 2-digit angle and sketches it on the line.
Player 2 throws the dice twice, makes a 2-digit angle and adds it on to the first angle.

Player 1 now calculates the size of the angle that remains. This is their score.

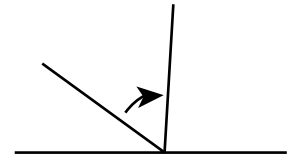
Players swap roles and play continues.

For example:

Player 1 throws 3 and 5 and sketches the angle 35°

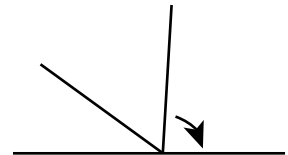


Player 2 throws 1 and 6 and sketches the angle 61°



Player 1 adds the two angles and calculates the missing angle.

$35 + 61 = 96$ $180 - 96 = 84$ so player 1 scores 84



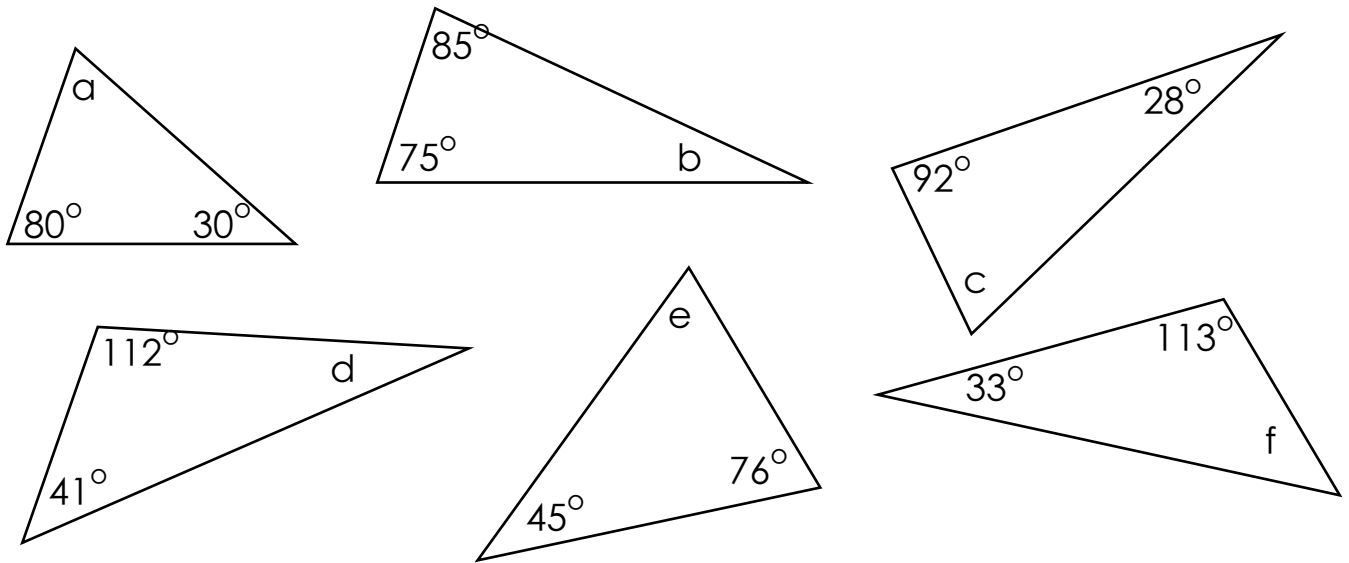
To win:

The winner is the first player to accumulate a total of 360.



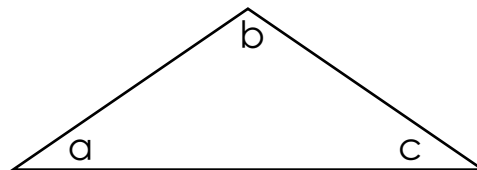
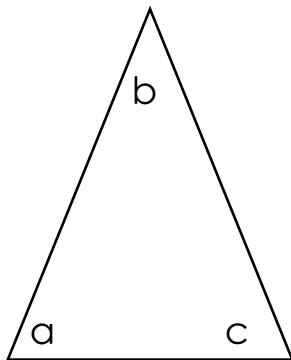
Do It 2

Calculate all the missing angles:
Not drawn to scale.



Challenge It 2

Investigate angles in isosceles triangles.



What are the possibilities if all angles must be multiples of five?

What are the possibilities for angle b if angle a is a multiple of 15?

Complete the statement: "As angle b increases by 10 so..."



Angles in an Isosceles Triangle Game

Play It 2

You need:
1 - 6 dice

To play:

Player 1 throws the dice twice, makes a 2-digit angle and chooses whether to label angle *a* or angle *b*.

Player 2 calculates the size of either angle *a* or *b* (whichever angle player 1 did not choose.) This is their score.

Players swap roles and play continues.

For example:

Player 1 throws 3 and 5 and labels angle *b* with 53°

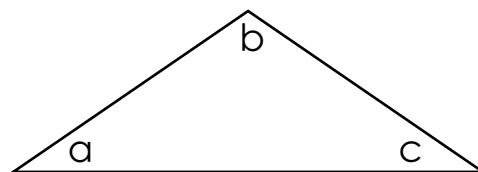
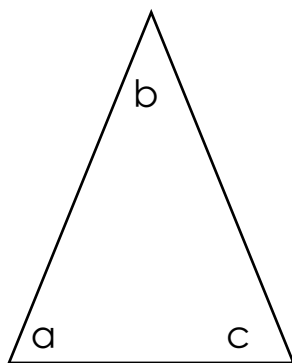
Player 2 calculates the angle at *a*: $180 - 53 = 127$

$$127 \div 2 = 63.5^\circ$$

so player 2 scores 63.5

To win:

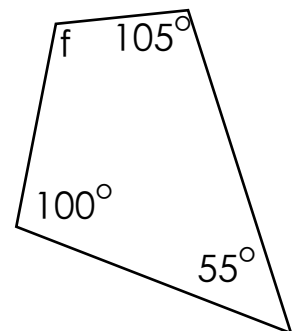
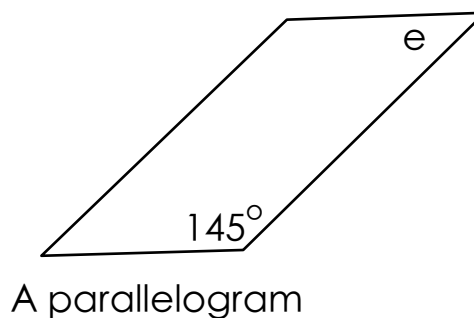
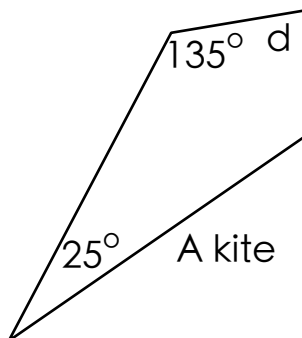
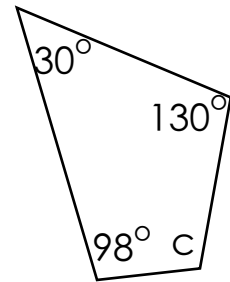
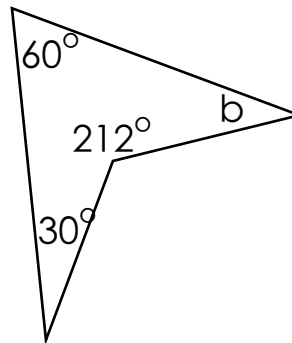
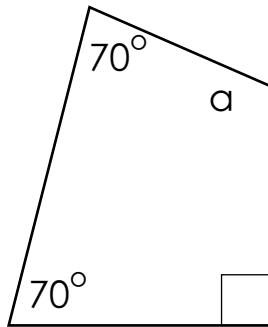
The winner is the first player to accumulate a total of 360.





Do It 3

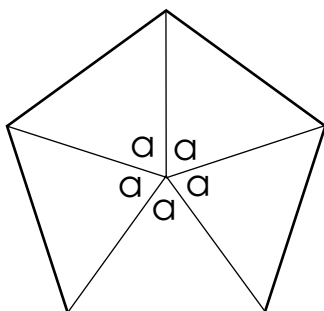
Calculate all the missing angles:
Not drawn to scale.



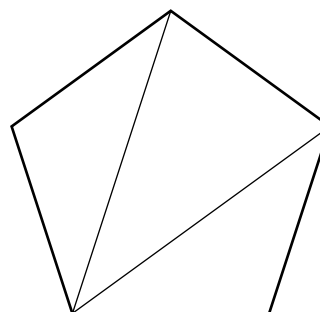
Challenge It 3

Calculate the interior angles in a regular pentagon in two different ways.

Split it into five isosceles triangles.
Divide 360 by 5 to calculate the angle a at the centre.
Now calculate the interior angle of the regular pentagon.



Split it into triangles from one point.
Multiply the number of triangles by 180
Now divide that total by 5 to calculate the interior angle of the regular pentagon.



Calculate the interior angles in other regular polygons in these two different ways.



Angles in a Kite Game

Play It 3

You need:
1 - 6 dice

To play:

Player 1 throws the dice twice, makes a 2-digit angle labels angle a .

Player 2 throws the dice twice, makes a 2-digit angle labels angle c

Player 1 calculates the size of angle b . This is their score.

Players swap roles and play continues.

For example:

Player 1 throws 2 and 5 and labels angle a with 25°

Player 2 throws 6 and 1 and labels angle c with 61°

Player 1 calculates the angle at b : $25 + 61 = 86$

$$360 - 86 = 274$$

$$274 \div 2 = 137$$

so player 1 scores 137

To win:

The winner is the first player to accumulate a total of 540.

