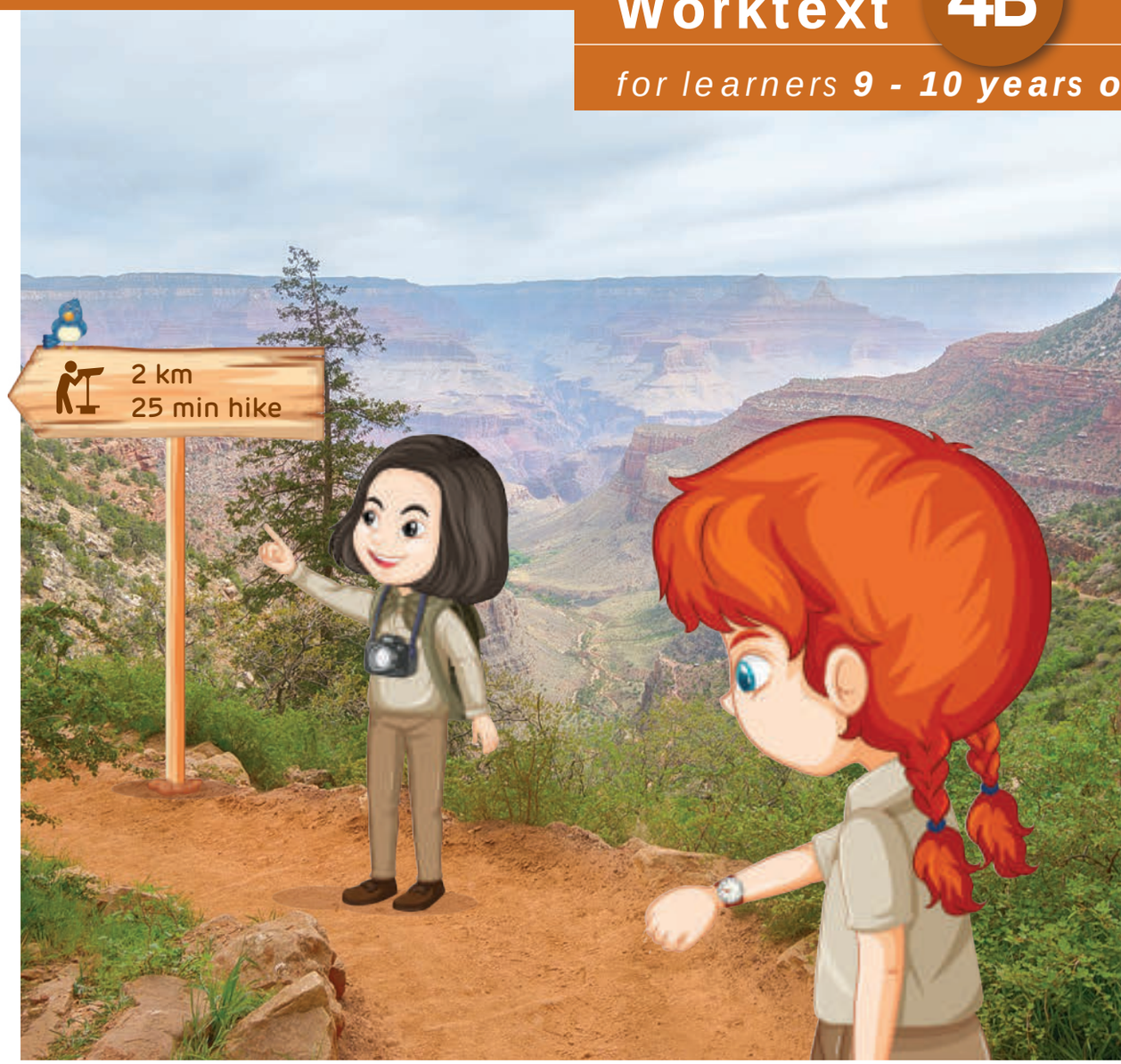
Let's Do MATHEMATICS

Worktext 4B

for learners ***9 - 10 years old***



Let's Do Mathematics

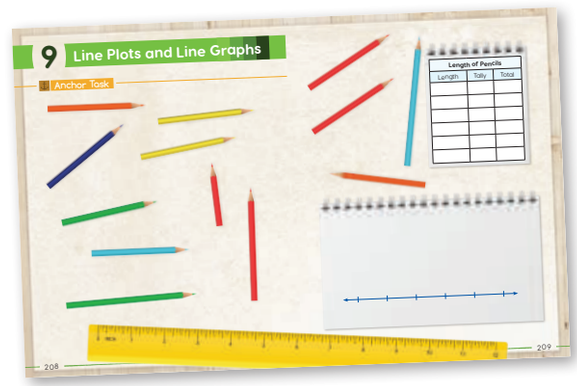
Let's Do Mathematics is a series covering levels K-6 and is fully aligned to the United States Common Core State Standards (USCCSS). Each level consists of two books (Book A and Book B) and combines textbook-style presentation of concepts as well as workbook practice.

Central to the USCCSS is the promotion of problem-solving skills and reasoning. Let's Do Mathematics achieves this by teaching and presenting concepts through a problem-solving based pedagogy and using the concrete-pictorial-abstract (CPA) approach. Learners acquire knowledge and understanding of concepts through a guided progression beginning with concrete examples and experiences which then flow into pictorial representations and finally mastery at the abstract and symbolic level. This approach ensures that learners develop a fundamental understanding of concepts rather than answering questions by learned procedures and algorithms.

Key features of the series include:

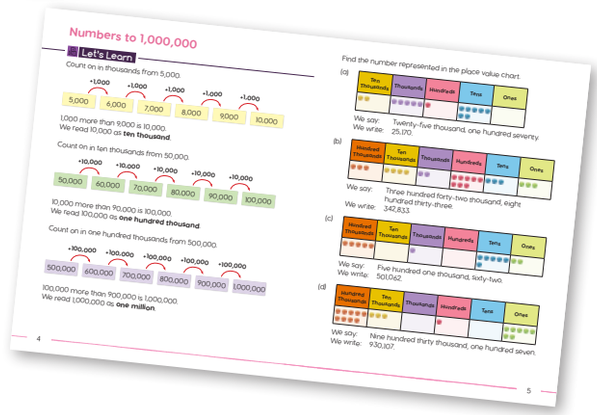
Anchor Task

Open-ended activities serve as the starting point for understanding new concepts. Learners engage in activities and discussions to form concrete experiences before the concept is formalized.



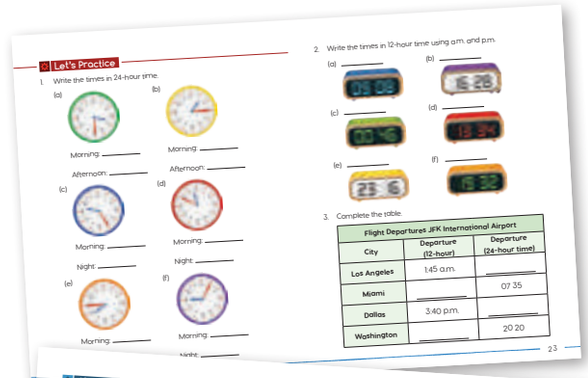
Let's Learn

Concepts are presented in a clear and colorful manner. Worked problems provide learners with guided step-by-step progression through examples. Series mascots provide guidance through helpful comments and observations when new concepts are introduced.



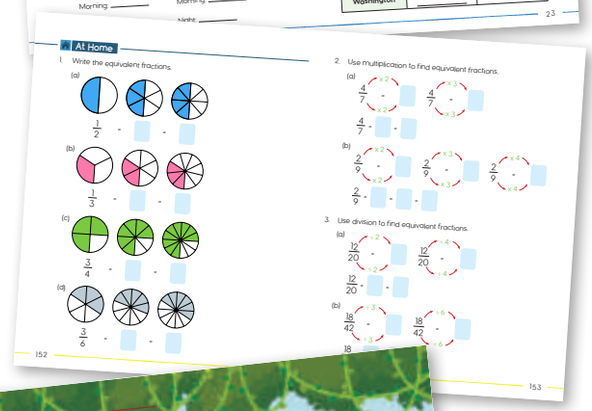
Let's Practice

Learners demonstrate their understanding of concepts through a range of exercises and problems to be completed in a classroom environment. Questions provide a varying degree of guidance and scaffolding as learners progress to mastery of the concepts.



At Home

Further practice designed to be completed without the guidance of a teacher. Exercises and problems in this section follow on from those completed under Let's Practice.

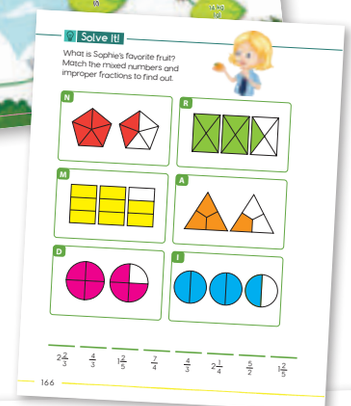


Hands On

Learners are encouraged to 'learn by doing' through the use of group activities and the use of mathematical manipulatives.

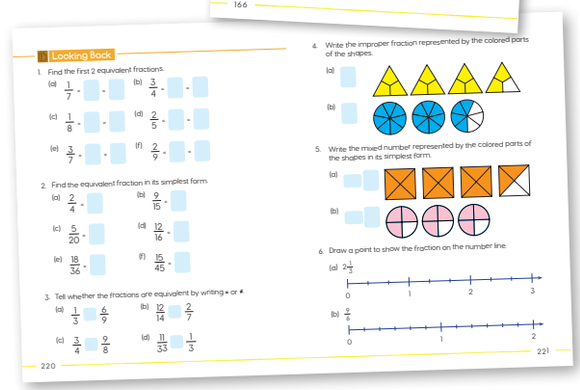
Solve It!

Activities that require learners to apply logical reasoning and problem-solving. Problems are often posed which do not have a routine strategy for solving them. Learners are encouraged to think creatively and apply a range of problem-solving heuristics.



Looking Back

Consolidated practice where learners demonstrate their understanding on a range of concepts taught within a unit.



Contents

5 Time

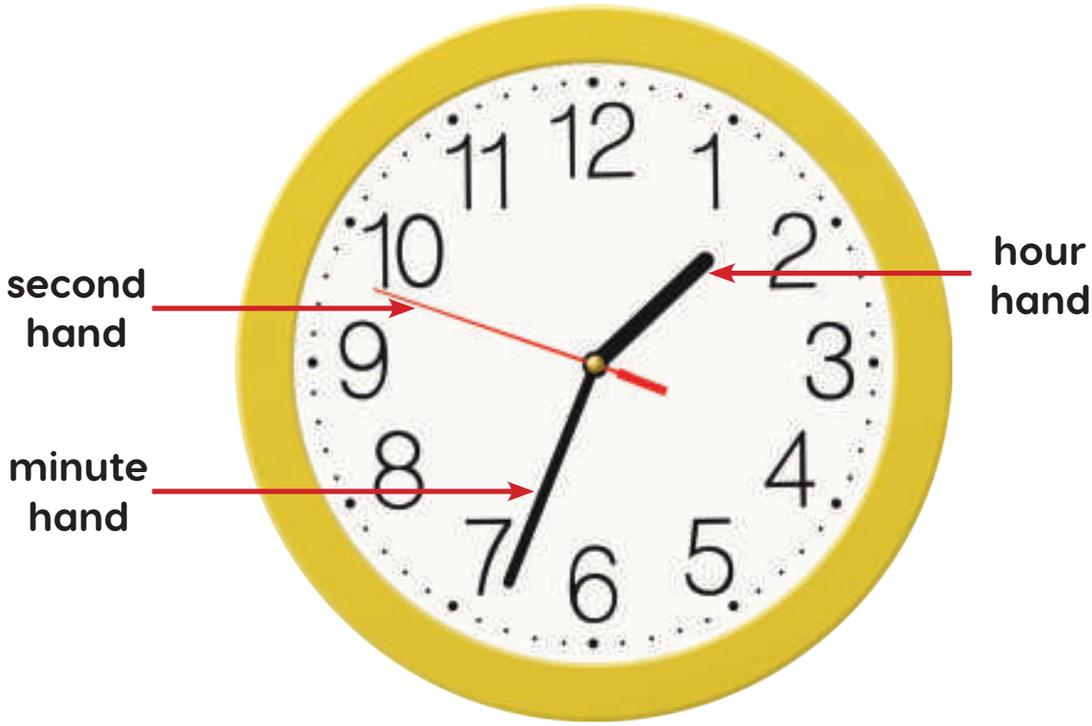
Converting Units of Time

Anchor Task

Activity	Time (s)	Time (min and s)

Let's Learn

The analog clock below has an hour hand, minute hand and second hand.



The **hour hand** moves the slowest. It takes the hour hand one hour to move from one number to the next. It takes the hour hand 12 hours to move once around the clock. There are 24 hours in one day. So, the hour hand moves around the clock 2 times in one day.

The **minute hand** moves faster than the hour hand. It takes the minute hand 5 minutes to move from one number to the next. It takes the minute hand 60 minutes, or one hour, to move once around the clock. There are 60 minutes in one hour.

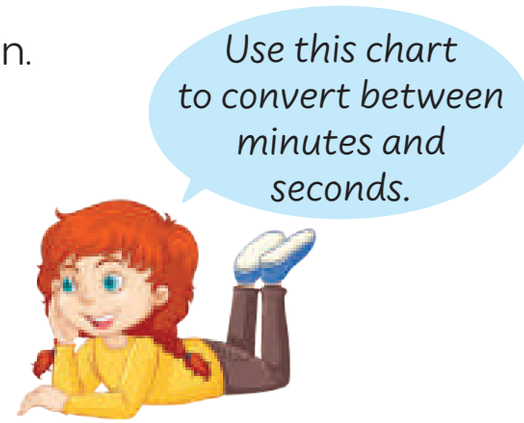
The **second hand** moves the fastest. It takes the second hand 5 seconds to move from one number to the next. It takes the second hand 60 seconds, or one minute, to move once around the clock. There are 60 seconds in one minute.

We know that in 1 minute there are 60 seconds.
How many seconds are there in 2 minutes?

2 min = 2 x 60 s
= 120 s

There are 120 s in 2 min.

1 min = 60 s
2 min = 120 s
3 min = 180 s
4 min = 240 s
5 min = 300 s



Blake finished a running race in 3 min 13 s.
Express the time in seconds.

3 min 13 s < 3 min = 180 s
13 s

3 min 13 s = 180 s + 13 s
= 193 s

Blake finished the running race in 193 seconds.

Express 255 seconds in minutes and seconds.

255 s = 240 s + 15 s
= 4 min 15 s

We know that in 1 hour there are 60 minutes.
How many minutes are there in 4 hours?

4 h = 4 x 60 min
= 240 min

There are 240 min in 4 hours.

1 h = 60 min
2 h = 120 min
3 h = 180 min
4 h = 240 min
5 h = 300 min

Sophie went on a hike for 4 h 35 min.
Express the time Sophie hiked in minutes.

4 h 35 min < 4 h = 240 min
35 min

4 h 35 min = 240 min + 35 min
= 275 min

Sophie hiked for 275 min.

Express 282 minutes in hours and minutes.

282 min = 240 min + 42 min
= 4 h 42 s

Let's Practice

1. Convert the times to seconds.

(a) Riley talked on the phone for 2 minutes 21 seconds.
How long did Riley talk on the phone in seconds?

2 min 21 s < _____ min = _____ s
_____ s

2 min 21 s = _____ s + _____ s

= _____ s

Riley talked on the phone for _____ seconds.

(b) Wyatt heated his dinner for 3 minutes 47 seconds.
How long did Wyatt heat his dinner for in seconds?

3 min 47 s < _____ min = _____ s
_____ s

3 min 47 s = _____ s + _____ s

= _____ s

Wyatt heated his dinner for _____ seconds.

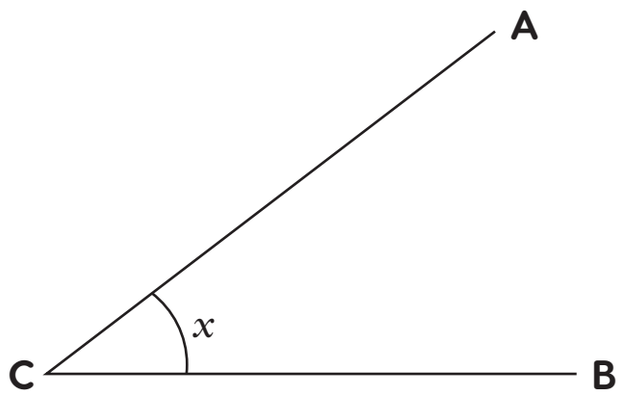
7 Angles

Anchor Task

Identifying and Naming Angles

Let's Learn

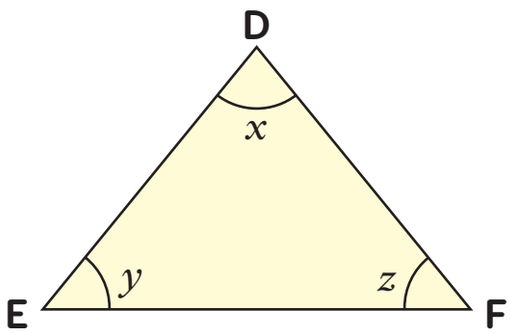
An angle is formed by two rays with a common endpoint.
The common endpoint where the rays meet is called a **vertex**.



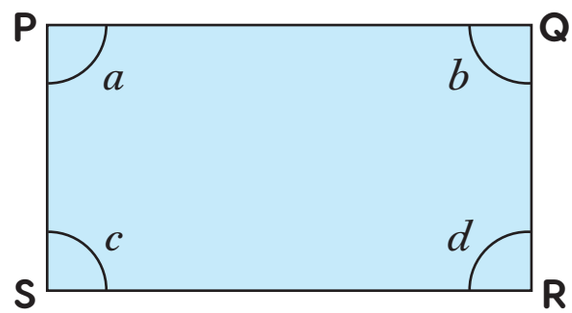
We use the symbol ∠ to name angles.

Rays AC and BC meet at vertex C to form an angle.
We can name the angle ∠ACB or ∠BCA.
We can also name the angle ∠x.

Angles are also formed within shapes.
A triangle has 3 sides and 3 angles.
A rectangle has 4 sides and 4 angles.



$\angle x = \angle EDF = \angle FDE$
$\angle y = \angle DEF = \angle FED$
$\angle z = \angle EFD = \angle DFE$

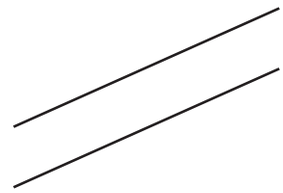


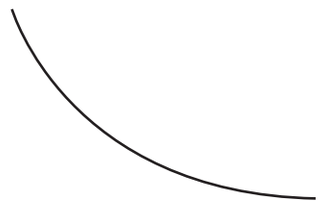
$\angle a = \angle SPQ = \angle QPS$
$\angle b = \angle PQR = \angle RQP$
$\angle c = \angle PSR = \angle RSP$
$\angle d = \angle SRQ = \angle QRS$

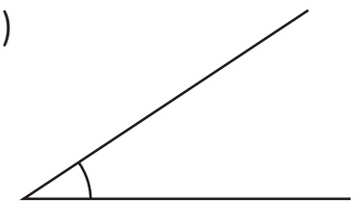
Let's Practice

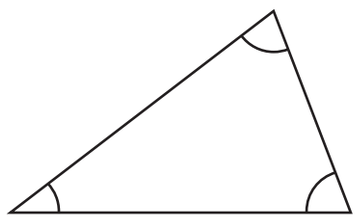
1. Circle the diagrams that show angles.

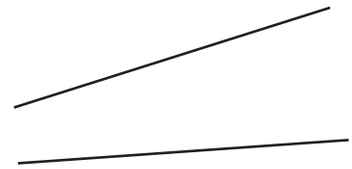
(a) 

(b) 

(c) 

(d) 

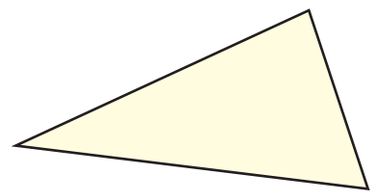
(e) 

(f) 

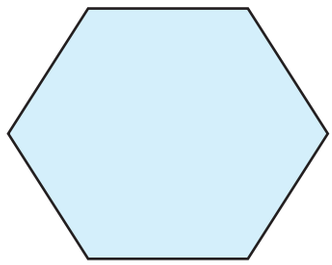
2. Circle the angles in each shape. Fill in the blanks.

(a) 

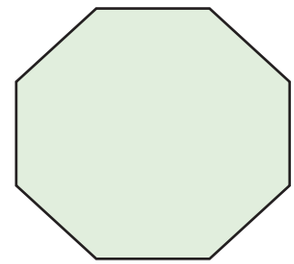
_____ sides _____ angles

(b) 

_____ sides _____ angles

(c) 

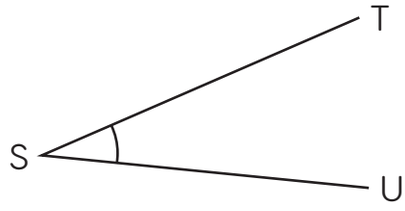
_____ sides _____ angles

(d) 

_____ sides _____ angles

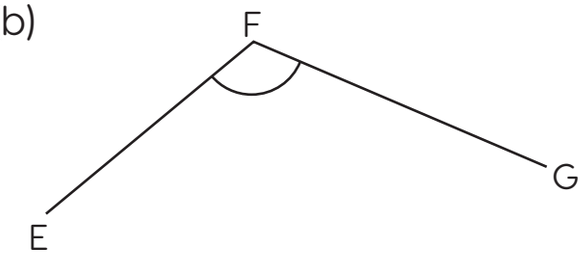
3. Name the angles.

(a)



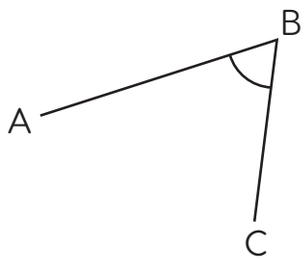
∠ _____

(b)



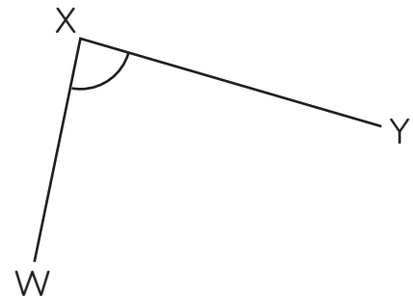
∠ _____

(c)



∠ _____

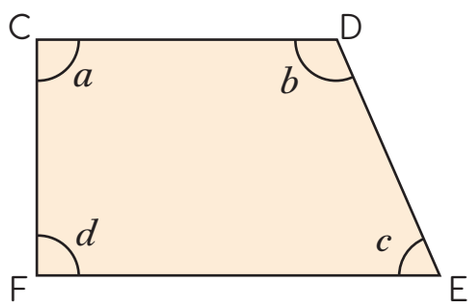
(d)



∠ _____

4. Name the angles in other ways.

(a)



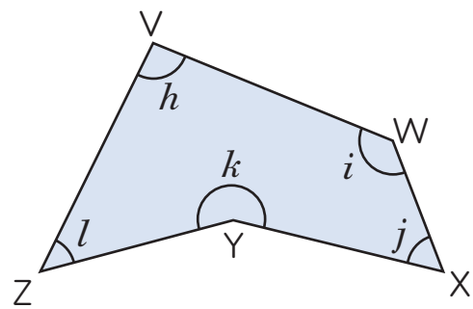
$\angle a$ = ∠ _____

∠ _____ = ∠CFE

$\angle c$ = ∠ _____

∠ _____ = ∠CDE

(b)



$\angle i$ = ∠ _____

∠ _____ = ∠VZY

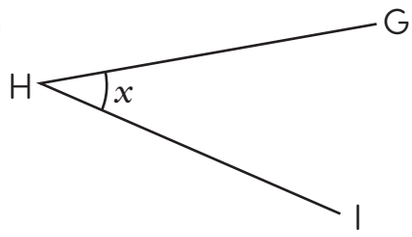
$\angle k$ = ∠ _____

∠ _____ = ∠WXY

At Home

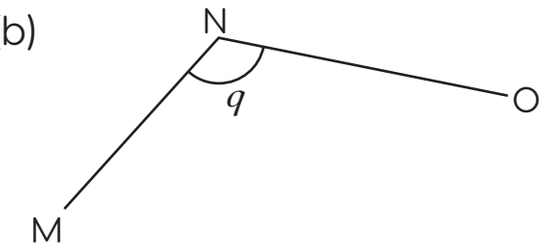
1. Name the angles.

(a)



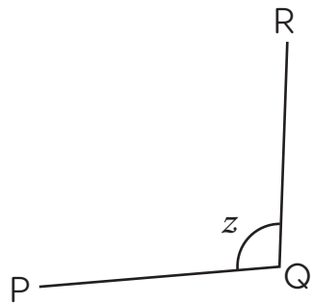
$\angle x = \angle$ _____

(b)



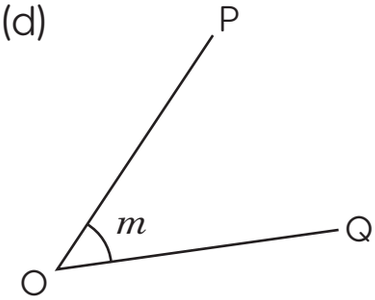
$\angle q = \angle$ _____

(c)



$\angle z = \angle$ _____

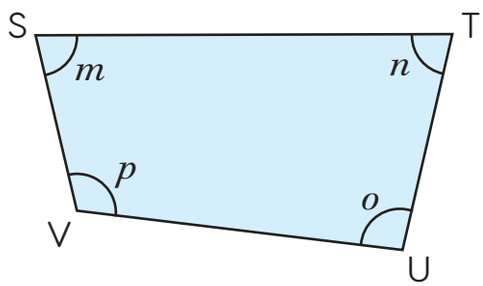
(d)



$\angle m = \angle$ _____

2. Name the angles.

(a)



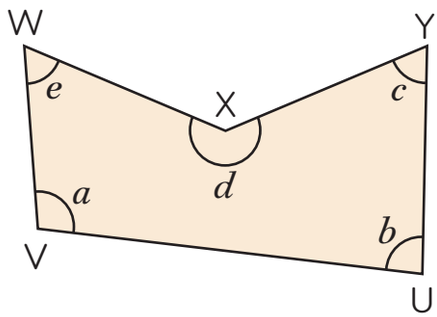
$\angle p = \angle$ _____

$\angle$ _____ = $\angle$VUT

$\angle m = \angle$ _____

$\angle$ _____ = $\angle$UTS

(b)



$\angle a = \angle$ _____

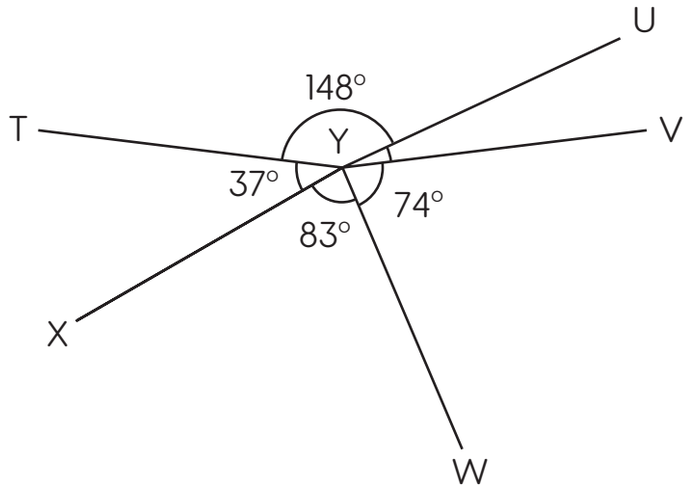
$\angle$ _____ = $\angle$WXY

$\angle e = \angle$ _____

$\angle$ _____ = $\angle$UYX

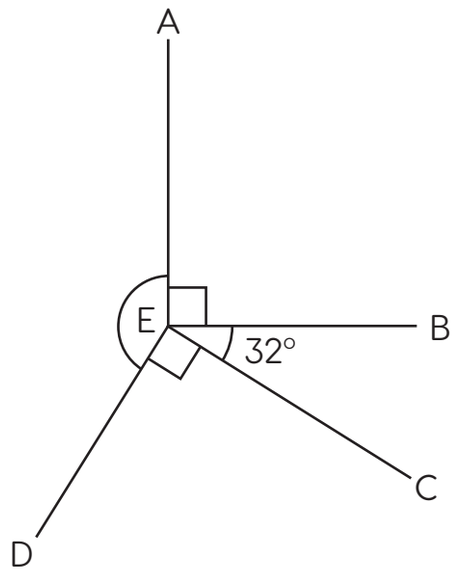
(d) All straight lines meet at point Y.

$\angle$ UYV = _____



(e) All straight lines meet at point E.

$\angle$ AED = _____



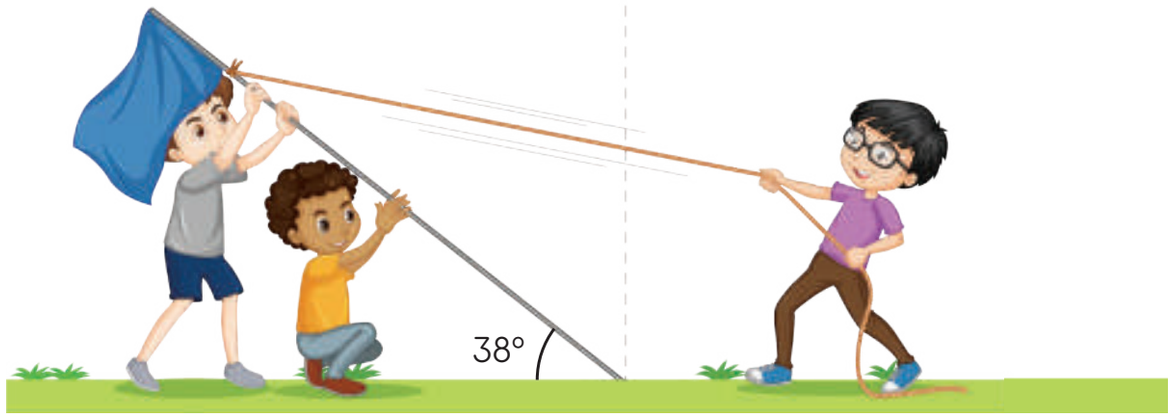
Word Problems

Let's Practice

1. Sophie tries to perform a 360° spin while ice skating. She manages to spin 327°. How much more does she need to turn to complete a full spin?

2. How many degrees does the minute hand of a clock turn in 15 minutes?

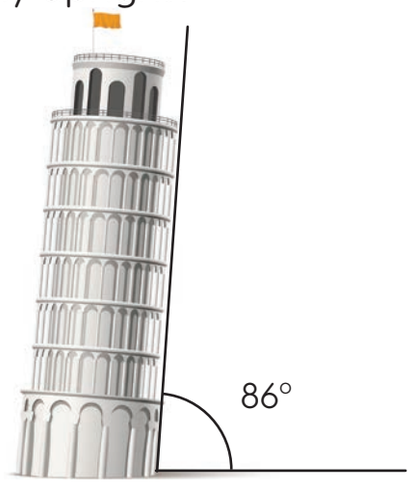
3. Ethan and his friends are erecting a flag pole. How much more do they have to turn the pole to make it upright?



4. A wrecking ball is pulled back by an angle of 28° and released. It swings to an angle that is 5° less than the release angle. Find the total angle that the wrecking ball swings.

At Home

1. The Leaning Tower of Pisa forms an angle of 86° to the ground as shown below. How many degrees must it turn to become fully upright?



2. A Ferris wheel turns 42° in 1 minute. How much does it turn in 5 minutes?

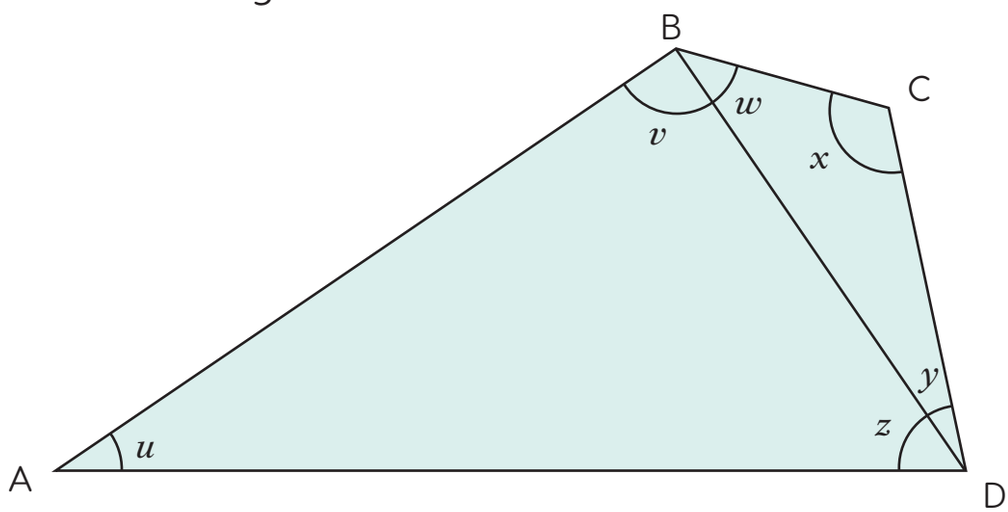
3. Look at the time shown on the clock below to answer the questions.

(a) How many degrees has the minute hand turned since 1 o'clock?

(b) The minute hand turns another 60°. What is the time now?

Looking Back

1. Name the angles.



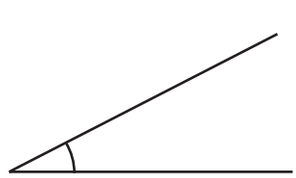
$\angle v = \angle$ _____ $\angle$ _____ = $\angle$BAD

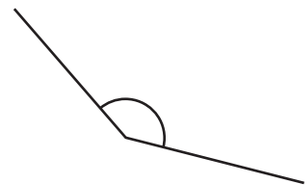
$\angle$ _____ = $\angle$BCD $\angle y = \angle$ _____

$\angle z = \angle$ _____ $\angle w = \angle$ _____

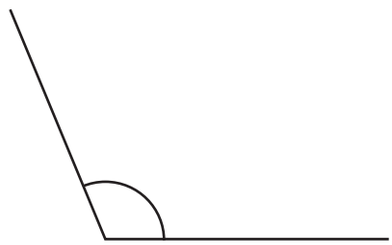
2. Check the bigger angle.

(a)

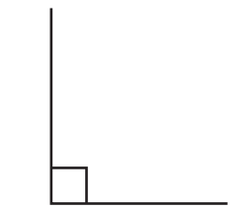
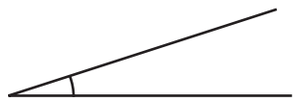
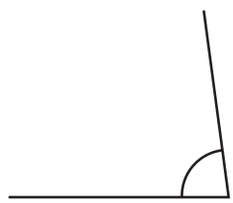
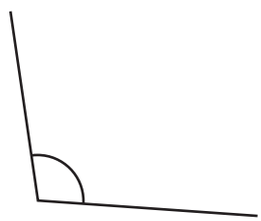
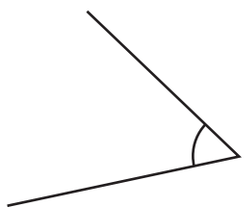
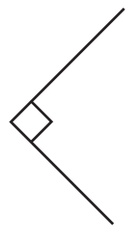




(b)



3. Check the box that applies to each angle. Use a piece of paper to help you.

Angle	Smaller than a right angle	Right angle	Bigger than a right angle
	☐	☐	☐
	☐	☐	☐
	☐	☐	☐
	☐	☐	☐
	☐	☐	☐
	☐	☐	☐

4. Draw and label the angles.

(a) $\angle WXY = 115^\circ$

(b) $\angle p = 64^\circ$

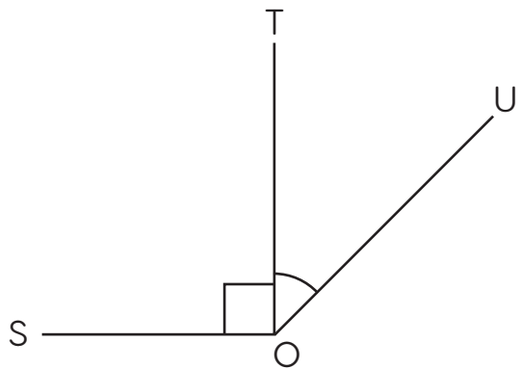
(c) $\angle PQR = 90^\circ$

(d) $\angle t = 120°$

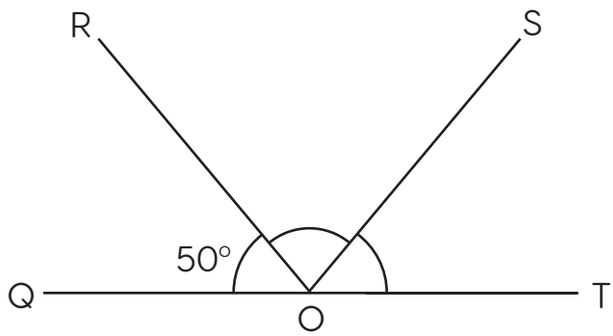
(e) $\angle ABC = 160°$

5. Find the unknown angle. Show your working.

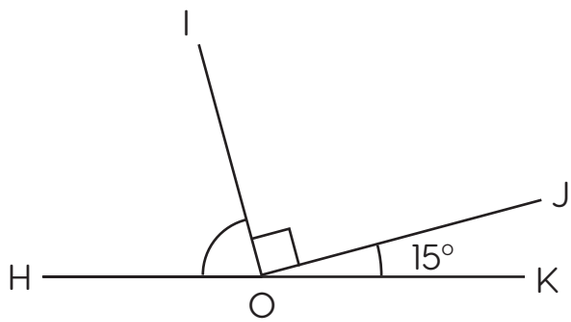
(a) $\angle SOU = 135°$ $\angle$ TOU = _____



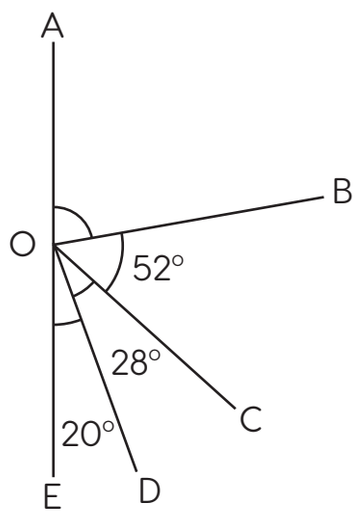
(b) QT is a straight line and ∠ ROQ = ∠ SOT. ∠ ROS = _____



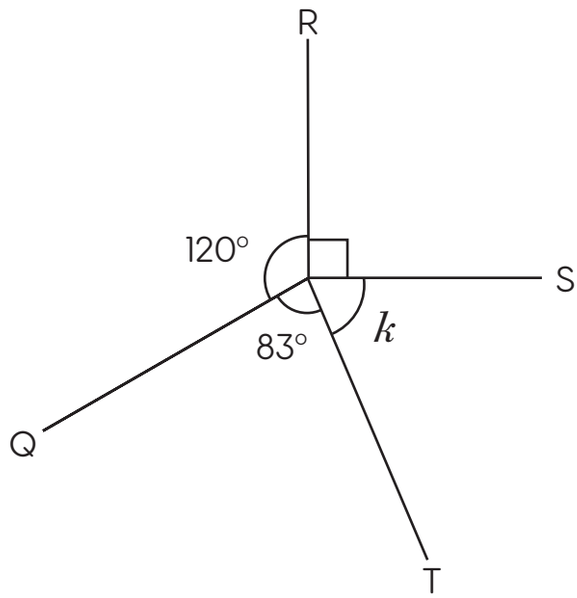
(c) HK is a straight line. ∠ HOI = _____



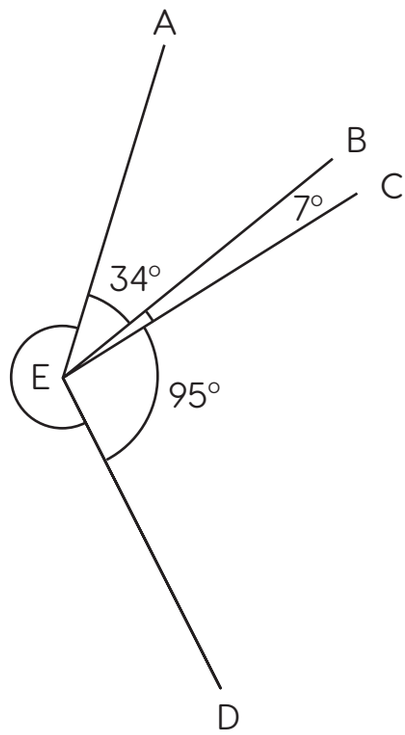
(d) AE is a straight line. ∠ AOB = _____



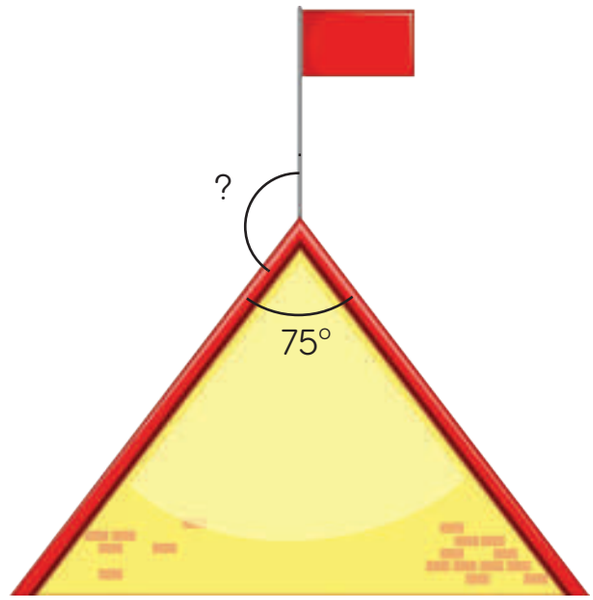
(e) All straight lines meet at a point. $\angle k =$ _____



(f) All straight lines meet at point E. $\angle$ AED = _____



6. The roof of a school building is the shape of a triangle and has a flag on top. Find the angle formed between the flag pole and the roof.



7. When the minute hand on a clock is pointing at 10, how many degrees must it turn to point at 12?