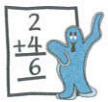
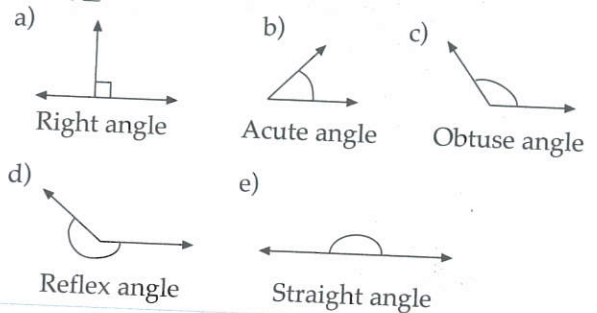
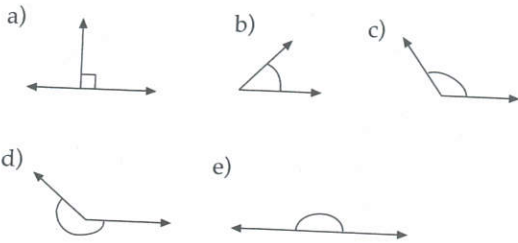


Angles – Naming angles and using a protractor to find the size of unknown angles.

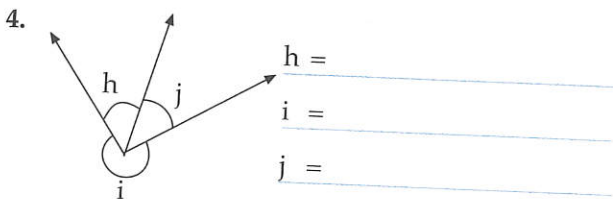
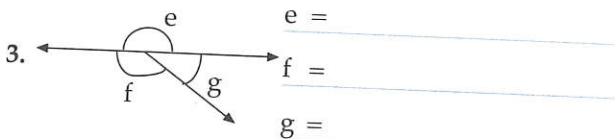
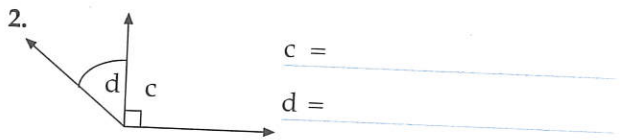
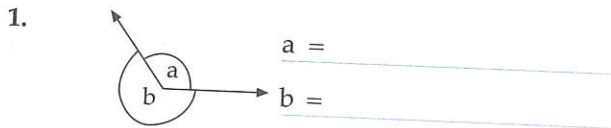


Example

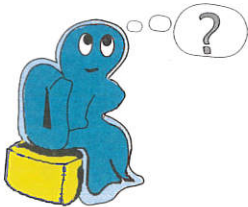
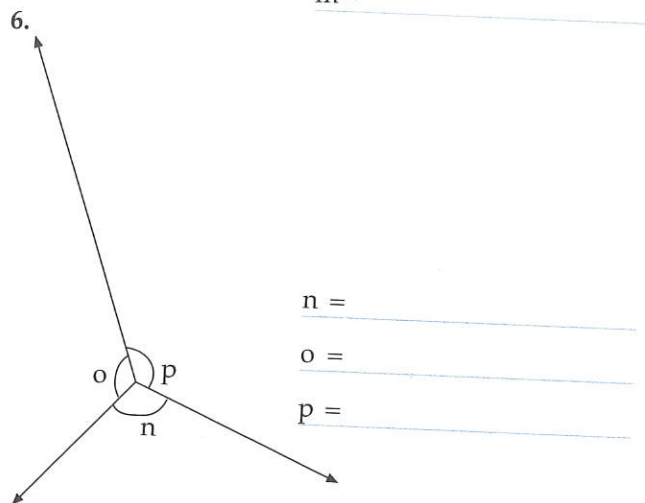
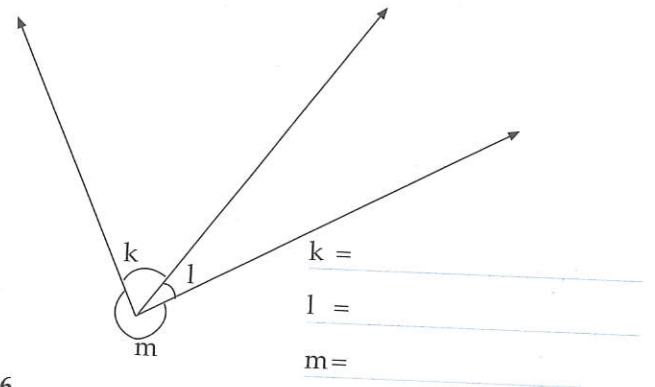
Name the following angles.



Name the following angles.

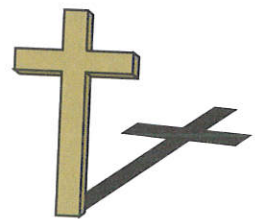


Use your protractor to measure the indicated angles.



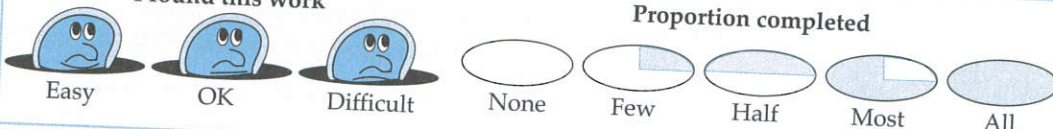
Problem Solving

A man who died left \$270 000 in his estate to be divided among his wife and 3 children. The two daughters were to each receive twice as much as the son and the wife was to receive twice as much as one of the daughters. How much did each receive?



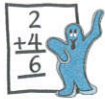
I found this work

Proportion completed



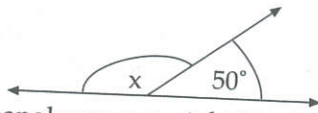
Date: _____

Angles on a Straight Line – Finding unknown angles on a line.



Example 1

Calculate the missing angle x .



Adjacent angles on a straight line sum to 180° .

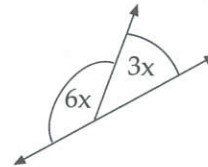


$$\begin{aligned} x + 50^\circ &= 180^\circ \\ x &= 180^\circ - 50^\circ \\ x &= 130^\circ \end{aligned}$$



Example 2

Calculate the value of x .



Adjacent angles on a straight line sum to 180° .

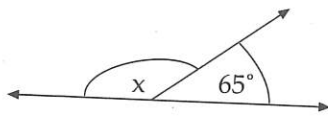


$$\begin{aligned} 6x + 3x &= 180^\circ \\ 9x &= 180^\circ \\ x &= 20^\circ \end{aligned}$$

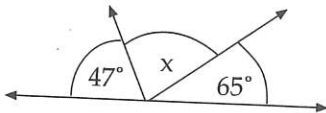


Calculate the value of x .

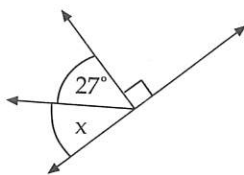
1.



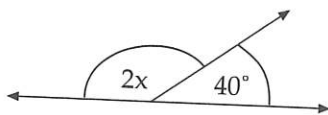
2.



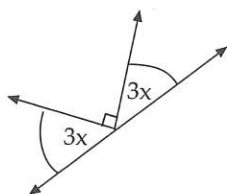
3.



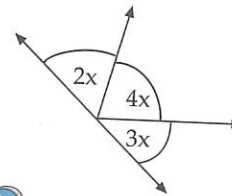
4.



5.



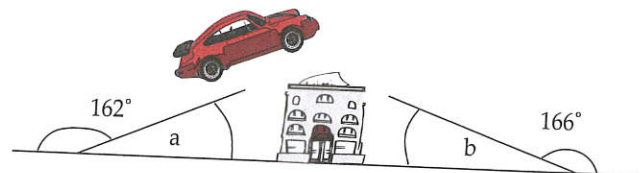
6.



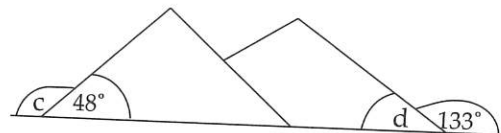
Application Problems

Answer the following questions.

7. A stunt driver is planning to drive her car up a ramp, jump over a building and then drive down the ramp on the other side. Calculate the missing angles on both sides of the ramp.



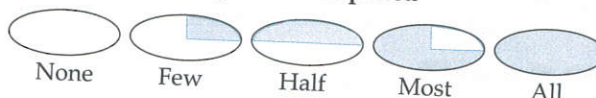
8. The roofline of a house is drawn below. Calculate the missing angles.



I found this work

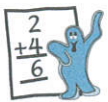


Proportion completed



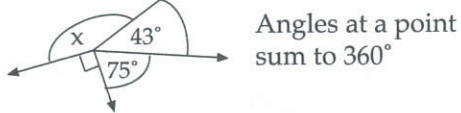
Date: _____

Angles at a Point – Finding unknown angles at a point.



Example 1

Calculate the missing angle x .



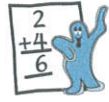
Angles at a point sum to 360°



$$x + 43^\circ + 75^\circ + 90^\circ = 360^\circ$$

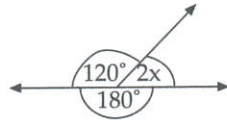
$$x = 360^\circ - 208^\circ$$

$$x = 152^\circ$$



Example 2

Calculate the value of x .



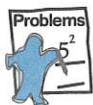
Angles at a point sum to 360°



$$2x + 180^\circ + 120^\circ = 360^\circ$$

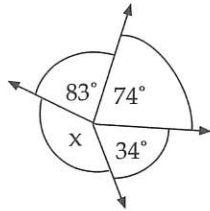
$$2x = 60^\circ$$

$$x = 30^\circ$$

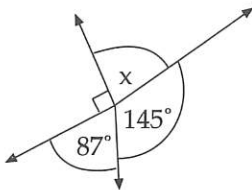


Calculate the value of x .

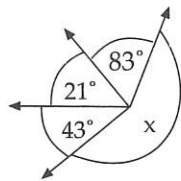
1.



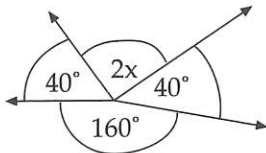
2.



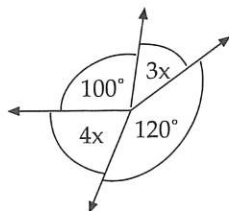
3.



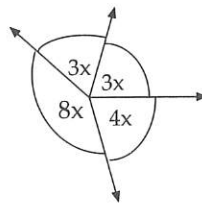
4.



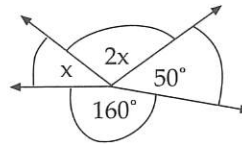
5.



6.



7.

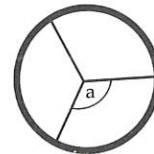




Application Problems

Answer the following questions.

8. Use symmetry to help calculate the marked angle in the steering wheel drawn below.



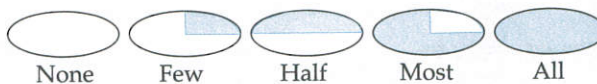
9. Calculate the marked angle in the snowflake drawn below.



I found this work




Proportion completed



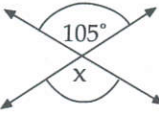
Date: _____

Vertically Opposite Angles – Finding unknown angles.




Example

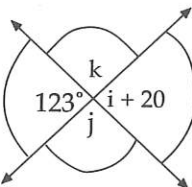
Calculate the missing angle x .



Vertically opposite angles are equal



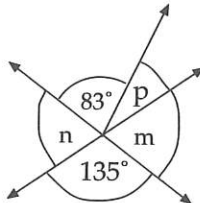
$x = 105^\circ$

5. 

$i =$ _____

$j =$ _____

$k =$ _____

6. 

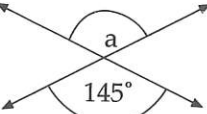
$m =$ _____

$n =$ _____

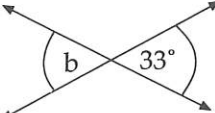
$p =$ _____



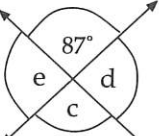
Find the value of the variable.

1. 

$a =$ _____

2. 

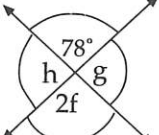
$b =$ _____

3. 

$c =$ _____

$d =$ _____

$e =$ _____

4. 

$f =$ _____

$g =$ _____

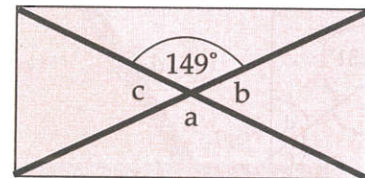
$h =$ _____



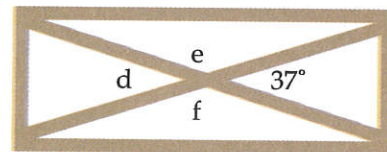
Application Problems

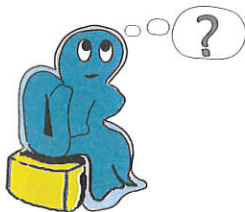
Answer the following questions.

7. The walls of a steel prefabricated building are strengthened by diagonal steel braces. Find the angles marked on the diagram of the wall section.



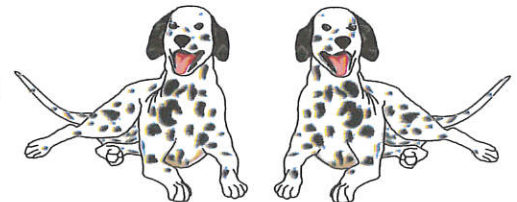
8. A wooden gate has two diagonal stays. Find the angles marked at the centre of the gate.








Problem Solving

Two Dalmatian dogs are seen sitting at the edge of a lake. The total number of spots on the dogs is 87. One of the dogs has 15 more spots than the other. How many spots are there on each of the dogs?








I found this work

Easy OK Difficult

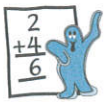
Proportion completed

None Few Half Most All

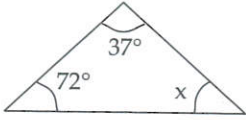
Date: _____

Angle Properties of a Triangle – Finding unknown angles in a triangle.



Example

Calculate the missing angle x .



The interior angles of a triangle sum to 180° .

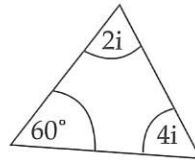


$$x + 72^\circ + 37^\circ = 180^\circ$$

$$x = 180^\circ - 109^\circ$$

$$x = 71^\circ$$

5.



$6i =$ _____

$i =$ _____



Application Problems

Find the unknown angles in the signs below.

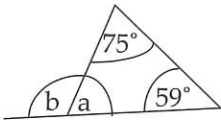
6.





Calculate the value of the unknown angles.

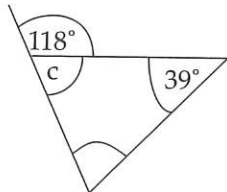
1.



$a =$ _____

$b =$ _____

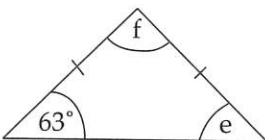
2.



$c =$ _____

$d =$ _____

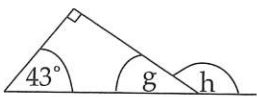
3.



$e =$ _____

$f =$ _____

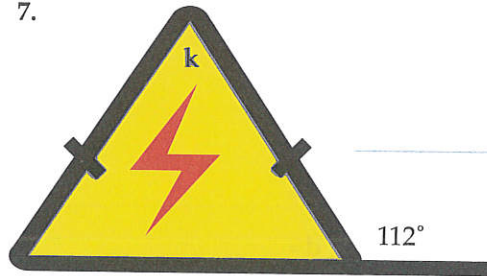
4.



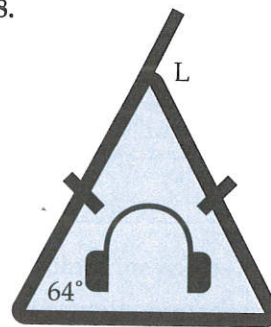
$g =$ _____

$h =$ _____

7.



8.





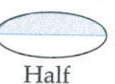
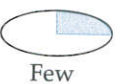
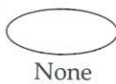
Problem Solving

Research shows that a smoker on average shortens their life by 5.5 minutes for every smoke they have. By how many full years would a person shorten their life if they smoked on average 20 cigarettes a day for 40 years?



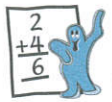
I found this work

Proportion completed



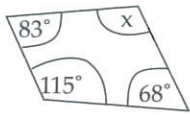
Date: _____

Angle Properties of a Quadrilateral – Finding unknown angles in a four-sided figure.



Example

Calculate the missing angle x .



The interior angles of a quadrilateral sum to 360° .



$$x + 83^\circ + 115^\circ + 68^\circ = 360^\circ$$

$$x + 266^\circ = 360^\circ$$

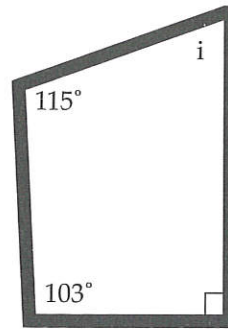
$$x = 94^\circ$$



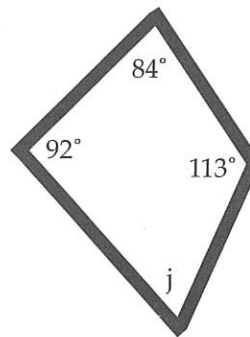
Application Problems

Find the unknown angles in the window shapes below.

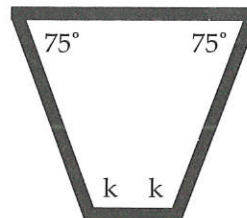
5.



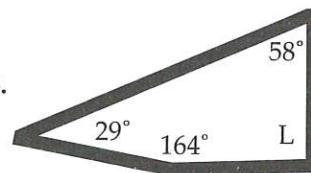
6.



7.



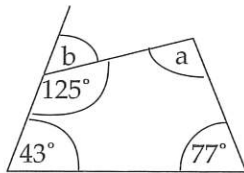
8.





Calculate the value of the unknown angles.

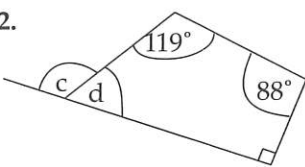
1.



$a =$ _____

$b =$ _____

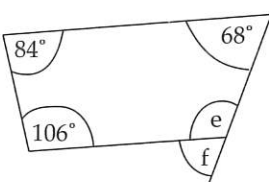
2.



$c =$ _____

$d =$ _____

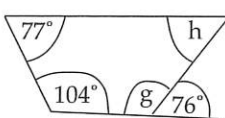
3.



$e =$ _____

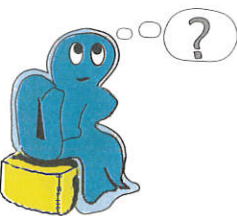
$f =$ _____

4.



$g =$ _____

$h =$ _____



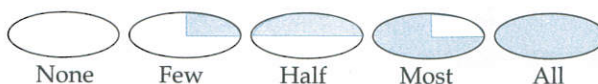
Problem Solving

List all the numbers less than 50 that have exactly 3 factors, including 1 and itself (a factor is a number that divides into another number without remainder).

- 1 2 3 4 5 6 7 8 9 10 11 12 13
- 14 15 16 17 18 19 20 21 22 23
- 24 25 26 27 28 29 30 31 32
- 33 34 35 36 37 38 39 40 41
- 42 43 44 45 46 47 48 49

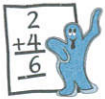
I found this work

Proportion completed



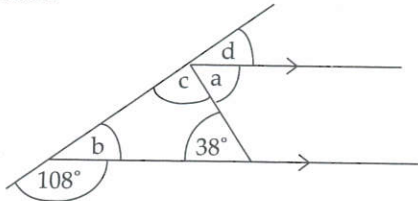
Date: _____

Angle Properties Mixed – Solving angle problems with reasons.



Example

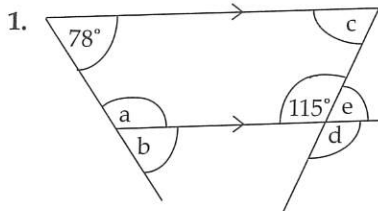
Calculate the missing angles in the figure below and give an appropriate reason for each.



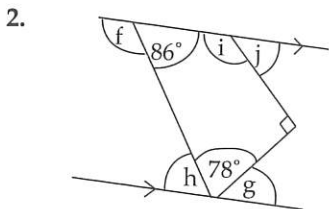
- $a = 38^\circ$ Alternate angles are equal, parallel lines.
- $b = 72^\circ$ Angles on a straight line sum to 180° .
- $c = 70^\circ$ Interior angles of a triangle sum to 180° .
- $d = 72^\circ$ Angles on a straight line sum to 180° .



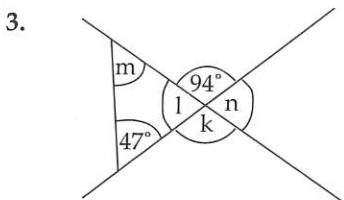
Calculate the missing angles below and give an appropriate reason for each (use the reason list below to help you).



- a = _____
- b = _____
- c = _____
- d = _____
- e = _____



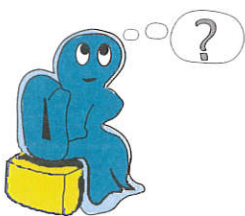
- f = _____
- g = _____
- h = _____
- i = _____
- j = _____



- k = _____
- l = _____
- m = _____
- n = _____

Reason List

- A Interior angles of a triangle sum to 180° .
- B Interior angles of a quadrilateral sum to 360° .
- C Alternate angles are equal, parallel lines.
- D Corresponding angles are equal, parallel lines.
- E Cointerior angles sum to 180° , parallel lines.
- F Vertically opposite angles are equal.
- G Adjacent angles on a straight line sum to 180° .
- H Angles at a point sum to 360° .



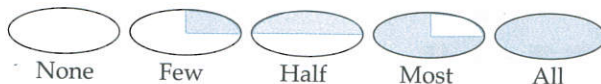
Problem Solving

At a party everybody shook hands with every other person. If there were 21 handshakes, how many people were present at the party?



I found this work

Proportion completed



Date: _____