St Andrew's Academy

Mathematics Department

COURSE 2 BLOCK 8

PRE-ASSESSMENT
LEARNING EVALUATION

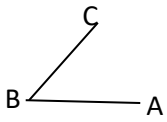
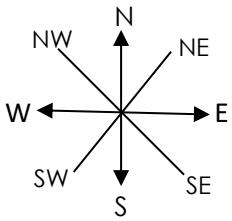
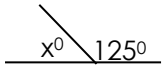
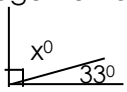
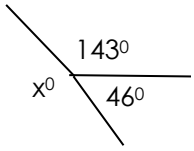
COURSE 2 BLOCK 8 **LEARNING EVALUATION**

	Red	Amber	Green	Revision Exercise
NUMBER				
○ I can simplify fractions and leave them in their simplest form, e.g. $\frac{18}{20} = \frac{9}{10}$	◯	◯	◯	• Number Exercise 1
○ Be able to add and subtract fractions with the same denominators, e.g. a) $\frac{2}{5} + \frac{1}{5} = \frac{3}{5}$ b) $\frac{6}{7} - \frac{4}{7} = \frac{2}{7}$	◯	◯	◯	• Number Exercise 2
○ Be able to add and subtract fractions with the different denominators, e.g. a) $\frac{2}{3} + \frac{4}{5} = \frac{10}{15} + \frac{12}{15} = \frac{22}{15} = 1\frac{7}{15}$ b) $\frac{5}{6} - \frac{3}{4} = \frac{10}{12} - \frac{9}{12} = \frac{1}{12}$	◯	◯	◯	• Number Exercise 3
○ Be able to add and subtract mixed numbers, e.g. a) $2\frac{2}{3} + 1\frac{3}{4} = \frac{8}{3} + \frac{7}{4} = \frac{32}{12} + \frac{21}{12} = \frac{53}{12} = 4\frac{5}{12}$ b) $3\frac{2}{3} - 1\frac{1}{2} = \frac{11}{3} - \frac{3}{2} = \frac{22}{6} - \frac{9}{6} = \frac{13}{6} = 2\frac{1}{6}$	◯	◯	◯	• Number Exercise 4
○ Be able to multiply fractions, e.g. a) $\frac{3}{4} \times \frac{5}{8} = \frac{15}{32}$ b) $2\frac{1}{2} \times 3\frac{3}{4} = \frac{5}{2} \times \frac{15}{4} = \frac{75}{8} = 9\frac{3}{8}$	◯	◯	◯	• Number Exercise 5
○ Be able to divide fractions, e.g. a) $\frac{3}{4} \div \frac{1}{2} = \frac{3}{4} \times \frac{2}{1} = \frac{6}{4} = 1\frac{2}{4} = 1\frac{1}{2}$ b) $2\frac{4}{5} \div 1\frac{1}{3} = \frac{14}{5} \div \frac{4}{3} = \frac{14}{3} \times \frac{3}{4} = \frac{42}{12} = 3\frac{1}{2}$	◯	◯	◯	• Number Exercise 6

COURSE 2 BLOCK 8 **LEARNING EVALUATION**

	Red	Amber	Green	Revision Exercise
ALGEBRA				
○ I can state the highest common factor (H.C.F) between two numbers and expressions. e.g. a) State the HCF between 18 and 24 Answer: HCF = 6 b) State the HCF between 3x and 12 Answer: HCF = 3 c) State the HCF between 4a and 6ab Answer: HCF = 2a d) State the HCF between $6g^2$ and 8gh Answer: HCF = 2g	◯	◯	◯	• Algebra Exercise 1
○ I can factorise algebraic expressions, using the highest common factor. e.g. a) $3x + 12 = 3(x + 4)$ b) $10y + 15xy = 5y(2 + 3x)$ c) $6ab^2 – 8a^2 = 2a(3b^2 – 4a)$ d) $18f^2g – 12\ fg^2 = 6fg(3f – 2g)$	◯	◯	◯	• Algebra Exercise 2

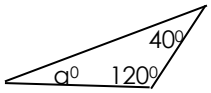
COURSE 2 BLOCK 8 **LEARNING EVALUATION**

	Red	Amber	Green	Revision Exercise
Shape and Angles				
○ I can name an angle using letters and describe the type of angle: e.g. < ABC is an acute angle. 	◯	◯	◯	• Shape and Angles Exercise 1
○ I can measure and draw angles accurately using a protractor.	◯	◯	◯	
○ I know the compass points and can state their bearings.  NE lies of a bearing of 045°	◯	◯	◯	• Shape and Angles Exercise 2
○ I can fill in the missing angles using the following angle properties:				
1. supplementary angles (angles in a straight line add together to give 180^0)  $x^0 = 180^0 - 125^0 = 55^0$	◯	◯	◯	• Shape and Angles Exercise 3 Q1
2. complimentary angles (angles that add together to give 90^0)  $x^0 = 90^0 - 33^0 = 57^0$	◯	◯	◯	• Shape and Angles Exercise 3 Q2
3. angles round point (all add up to 360^0)  $x^0 = 360^0 - (143^0 + 46^0) = 171^0$	◯	◯	◯	• Shape and Angles Exercise 4

COURSE 2 BLOCK 8 **LEARNING EVALUATION**

4. angles in triangle (all add up to 180°)

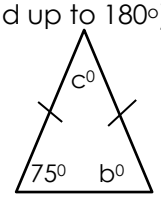
a)



Scalene Triangle

$a^0 = 180^0 - (120^0 + 40^0)$
$= 20^0$

b)

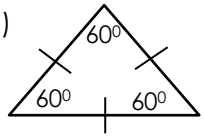


Isosceles Triangle

$b^0 = 75^o$

$c^o = 180^0 - (75^0 + 75^0)$
$= 30^0$

c)

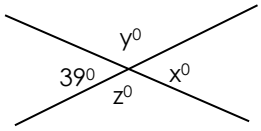


Equilateral Triangle

All angles are the same = $180^0 \div 3 = 60^0$

- Shape and Angles Exercise 5

5. vertically opposite angles – are the same



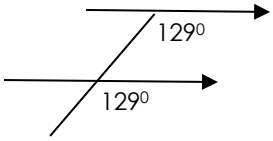
$x^0 = 39^o$

$y^o = 180^0 - 39^0 = 141^0$

$z^o = 141^0$

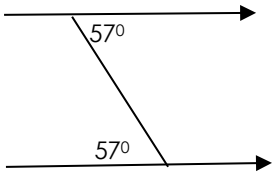
- Shape and Angles Exercise 6

6. corresponding angles (F-angles)
   - are the same.



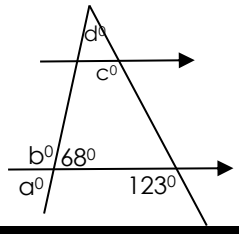
- Shape and Angles Exercise 7

7. alternate angles (Z-angles)
   - are the same.



- Shape and Angles Exercise 8

- I can use the above angle rules to fill out angles in more complex diagrams:
  e.g.



$a^0 = 68^0$

$b^0 = 112^0$

$c^0 = 123^0$

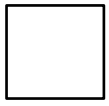
$d^0 = 55^0$

- Shape and Angles Exercise 9

COURSE 2 BLOCK 8 **LEARNING EVALUATION**

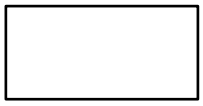
- Fill in the missing angles in a quadrilateral shape (4-sided shape – all angles add up to 360^o)
  e.g.

- I understand the properties of 2D shapes:



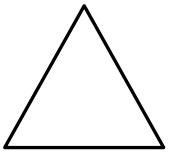
Square – 4-sided shape

- All sides equal, all angles equal (90^0)
- Four vertices and 4 edges.



Rectangle – 4-sided shape

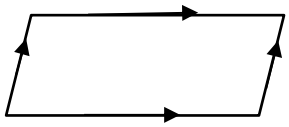
- opposite sides equal, all angles equal (90^0)
- Four vertices and 4 edges.



Triangle

– 3-sided shape

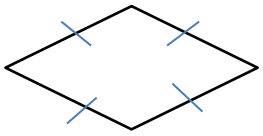
- Three vertices and 3 edges.



Parallelogram

– 4-sided shape

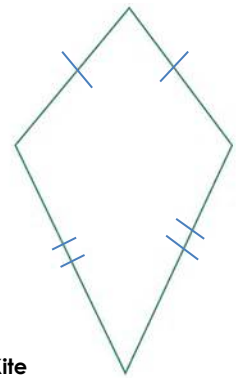
- Four vertices and 4 edges.
- Two pairs of parallel line. Each pair the same length.



Rhombus

– 4-sided shape

- Four vertices and 4 edges.
- All sides the same length.



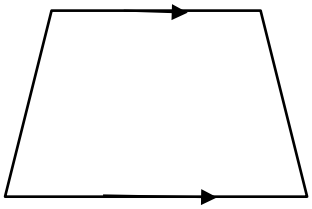
Kite

– 4-sided shape

- Four vertices and 4 edges.
- Opposite sides the same length.

- Shape and Angles Exercise 10
- Shape and Angles Exercise 11

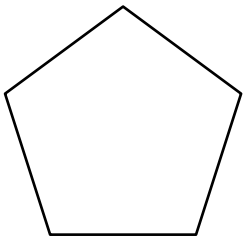
COURSE 2 BLOCK 8 **LEARNING EVALUATION**



Trapezium

– 4-sided shape

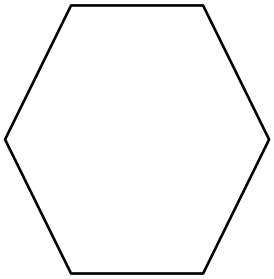
- Four vertices and 4 edges.
- One set of parallel lines.



Pentagon

– 5-sided shape

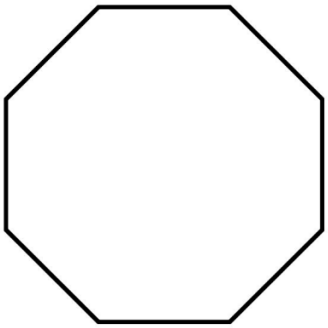
- Five vertices and 5 edges.
- All sides are the same length.



Hexagon

– 6-sided shape

- Six vertices and 6 edges.
- All sides are the same length.



Octagon

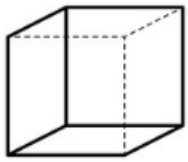
– 8-sided shape

- Eight vertices and 8 edges.
- All sides are the same length.

COURSE 2 BLOCK 8 **LEARNING EVALUATION**

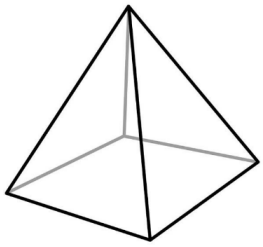
- I understand the properties of 3D shapes:

Cube
- 6 faces, all square
- 8 vertices
- 12 edges
- all lengths are the same

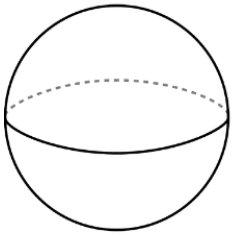


Cuboid
- 6 faces, all rectangles
- 8 vertices
- 12 edges

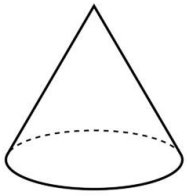
Cylinder
- one curved surface
- two flat faces
- the flat faces are circles



Square Based Pyramid
- 5 vertices, 8 edges
- 4 flat faces are triangles
- 1 flat face is a square

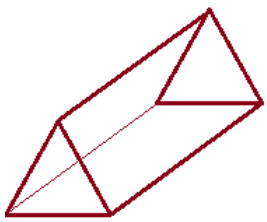


Sphere
- no flat edges
- no straight edges
- one curved face



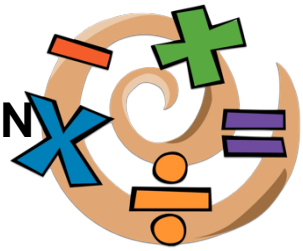
Cone
- one curved surface
- one flat face
- the flat face is a circle

Triangular Prism
- 5 faces
- 6 vertices, 9 edges
- 3 faces are rectangular
- 2 faces are triangles.



- Shape and Angles Exercise 12

COURSE 2 BLOCK 8 **REVISION**



NUMBER REVISION

Exercise 1

Write the following fractions in their simplest form:

a) $\frac{6}{9}$ b) $\frac{9}{18}$ c) $\frac{4}{12}$ d) $\frac{12}{15}$ e) $\frac{18}{24}$ f) $\frac{20}{45}$ g) $\frac{16}{28}$

h) $\frac{32}{40}$ i) $\frac{14}{35}$ j) $\frac{17}{34}$ k) $\frac{56}{72}$ l) $\frac{81}{90}$ m) $\frac{55}{121}$ n) $\frac{36}{84}$

Exercise 2

Complete the following calculations, leaving your answer in its simplest form:

a) $\frac{2}{5}+\frac{1}{5}$ b) $\frac{7}{8}-\frac{3}{8}$ c) $\frac{4}{7}+\frac{2}{7}$ d) $\frac{11}{12}-\frac{7}{12}$

e) $\frac{5}{9}+\frac{2}{9}$ f) $\frac{7}{11}-\frac{5}{11}$ g) $\frac{1}{6}+\frac{2}{6}$ h) $\frac{9}{10}-\frac{3}{10}$

i) $\frac{2}{14}+\frac{3}{14}$ j) $\frac{11}{20}-\frac{3}{20}$ k) $\frac{5}{9}+\frac{2}{9}$ l) $\frac{5}{6}-\frac{1}{6}$

Exercise 3

Complete the following calculations, leaving your answer in its simplest form:

a) $\frac{2}{5}+\frac{3}{4}$ b) $\frac{7}{8}-\frac{1}{2}$ c) $\frac{4}{7}+\frac{2}{3}$ d) $\frac{7}{12}-\frac{2}{5}$

e) $\frac{3}{7}+\frac{2}{5}$ f) $\frac{7}{9}-\frac{1}{2}$ g) $\frac{4}{5}+\frac{2}{3}$ h) $\frac{9}{10}-\frac{3}{4}$

i) $\frac{2}{3}+\frac{3}{4}$ j) $\frac{7}{8}-\frac{2}{5}$ k) $\frac{5}{9}+\frac{2}{3}$ l) $\frac{5}{6}-\frac{3}{4}$

Exercise 4

1. Complete the following calculations, leaving your answer in its simplest form:

a) $3\frac{1}{2} + 1\frac{2}{3}$ b) $1\frac{3}{5} + 2\frac{5}{6}$ c) $5\frac{1}{2} + 1\frac{2}{3}$ d) $4 + 2\frac{3}{4}$

e) $2\frac{5}{6} - 1\frac{1}{2}$ f) $3\frac{2}{3} - 1\frac{3}{4}$ g) $5\frac{1}{4} - 2\frac{3}{8}$ h) $6 - 4\frac{2}{3}$

2. Mark ran $2\frac{1}{3}$ km and Shaun ran $3\frac{1}{5}$ km. Find the difference in the distance that they ran.

3. Brandon and his son went fishing. Brandon caught $3\,{}^{3}/_{4}$ kg of fish while his son caught $2\,{}^{1}/_{5}$ kg of fish. What is the total weight of the fishes that they caught?

4. For the school's sports day, a group of students prepared $21\frac{1}{2}$ litres of lemonade. At the end of the day they had $2\frac{5}{8}$ litres left over. How many litres of lemonade were sold?

Exercise 5

1. Complete the following calculations, leaving your answer in its simplest form:

a) $\frac{1}{2} \times \frac{3}{4}$ b) $\frac{2}{5} \times \frac{5}{7}$ c) $\frac{3}{4} \times \frac{4}{7}$ d) $\frac{8}{9} \times \frac{3}{5}$ e) $\frac{5}{6} \times \frac{2}{3}$

f) $\frac{2}{3} \times \frac{3}{4}$ g) $\frac{3}{7} \times \frac{1}{4}$ h) $\frac{3}{5} \times \frac{6}{7}$ i) $\frac{5}{12} \times \frac{1}{2}$ j) $\frac{8}{11} \times \frac{2}{3}$

2. Complete the following calculations, leaving your answer in its simplest form:

a) $2\frac{1}{4} \times 1\frac{2}{3}$ b) $3\frac{1}{2} \times 2\frac{3}{5}$ c) $1\frac{1}{2} \times 2\frac{1}{3}$ d) $5\frac{2}{3} \times 2\frac{1}{5}$

e) $2\frac{1}{3} \times 1\frac{2}{5}$ f) $5\frac{1}{2} \times 1\frac{3}{4}$ g) $4\frac{2}{3} \times 1\frac{1}{7}$ h) $3\frac{2}{3} \times 2\frac{1}{4}$

3. Complete the following calculations, leaving your answer in its simplest form:

a) $\frac{1}{5} \times 3$ b) $7 \times \frac{1}{5}$ c) $\frac{1}{2} \times 8$ d) $4 \times \frac{1}{10}$

e) $8 \times \frac{3}{4}$ f) $\frac{2}{3} \times 12$ g) $5 \times 1\frac{1}{3}$ h) $8 \times 2\frac{2}{5}$

4. Alexis has a pet dog, Maxi. Each day, Maxi eats $\frac{5}{9}$ of a can of dog food. Alexis is buying dog food for one week. How many cans of dog food should Alexis buy?

5. A wall measures by $3\frac{3}{4}$ m by $4\frac{1}{3}$ m.
Each can of paint cover 2.5m² and costs £5.50
Work out the cost of painting the wall.

Exercise 6

1. Complete the following calculations, leaving your answer in its simplest form:

a) $\frac{3}{4} \div \frac{1}{2}$ b) $\frac{5}{6} \div \frac{2}{3}$ c) $\frac{7}{9} \div \frac{2}{3}$ d) $\frac{3}{5} \div \frac{1}{2}$ e) $\frac{3}{4} \div \frac{4}{5}$

f) $\frac{9}{10} \div \frac{1}{3}$ g) $\frac{6}{11} \div \frac{5}{6}$ h) $\frac{4}{5} \div \frac{3}{4}$ i) $\frac{7}{12} \div \frac{2}{3}$ j) $\frac{8}{11} \div \frac{3}{4}$

2. Complete the following calculations, leaving your answer in its simplest form:

a) $2\frac{1}{4} \div 1\frac{2}{3}$ b) $3\frac{1}{2} \div 1\frac{3}{5}$ c) $2\frac{1}{2} \div 1\frac{1}{3}$ d) $3\frac{2}{3} \div 2\frac{1}{5}$

e) $4\frac{1}{3} \div 1\frac{2}{5}$ f) $5\frac{1}{2} \div 2\frac{3}{4}$ g) $3\frac{2}{3} \div 1\frac{1}{7}$ h) $3\frac{2}{3} \div \frac{3}{4}$

3. Complete the following calculations, leaving your answer in its simplest form:

a) $\frac{3}{4} \div 2$ b) $\frac{4}{7} \div 8$ c) $\frac{11}{20} \div 3$ d) $\frac{9}{40} \div 5$

e) $4 \div \frac{2}{3}$ f) $2 \div \frac{2}{3}$ g) $12 \div \frac{3}{4}$ h) $5 \div \frac{2}{9}$

4. A cook has $18\frac{3}{4}$ pounds of ground beef. How many quarter- pound burgers can he make?

ALGEBRA REVISION

Exercise 1

1. (a) List all the factors of 10
   (b) List all the factors of 15
   (c) Write down all the common factors of 10 and 15.

2. (a) List all the factors of 12
   (b) List all the factors of 18
   (c) Write down all the common factors of 12 and 18.

3. Find the highest common factor (HCF) of each of these pairs of numbers:

(a) 4 and 14	(b) 6 and 9	(c) 9 and 21
(d) 8 and 12	(e) 6 and 15	(f) 10 and 17
(g) 30 and 45	(h) 40 and 60	(i) 28 and 63
(j) 24 and 36	(k) 16 and 28	(l) 18 and 45
(m) 150 and 200	(n) 12 and 54	(o) 90 and 270

4. Find the highest common factor (HCF) of each of these sets of numbers:

(a) 12, 6 and 15	(b) 27, 33 and 12	(c) 30, 15 and 25
(d) 8, 20 and 12	(e) 12, 24 and 30	(f) 9, 36 and 45

5. Find the highest common factor for each of the following:

(a) 4 and $12d$	(b) $2x$ and 16	(c) gh and g^2
(d) $6x$ and$18y$	(e) $12mn$ and $8m$	(f) $3uv$ and $4uw$
(g) $18mp$ and $9mn$	(h) $27xyz$ and $45xz$	(i) $2x$ and $4x^2$
(j) $3c^3$ and $2c^2$	(k) $5x^3$ and $15xy$	(l) $18d^4$ and $6ed^2$

Exercise 2

1. Factorise the following expressions:

(a) $4x + 6$	(b) $15x + 20$	(c) $9y - 12$	(d) $5x + 15$
(e) $6x - 3$	(f) $4x + 8$	(g) $5y - 25$	(h) $8w + 24$
(i) $10y + 15$	(j) $14w + 21$	(k) $20y - 30$	(l) $27x + 18$
(m) $6 - 4x$	(n) $9 + 12y$	(o) $45 + 60x$	(p) $16y - 32$
(q) $22a + 55$	(r) $100 - 40y$	(s) $6x + 9y$	(t) $4w - 2a$
(u) $25y - 35z$	(v) $8x^2 + 20$	(w) $30y^3 - 15$	(x) $42y + 28x - 56c$

2. Factorise the following expressions:

(a) $x^2 + 7x$	(b) $x^2 - 3x$	(c) $y^2 + y$	(d) $w^2 + 9w$
(e) $x^2 - 7x$	(f) $4w^2 + 10w$	(g) $6x^2 - 8x$	(h) $9y^2 - 6y$
(i) $10c + c^2$	(j) $5g - g^2$	(k) $14x^2 + 35x$	(l) $40x^2 - 50x$
(m) $12x^2 + 18x$	(n) $24x^2 - 18x$	(o) $45y^2 + 60y$	(p) $7w^2 + 2w$

3. Factorise the following expressions:

(a) $x^2 + xy$	(b) $a^2 - ab$	(c) $xy + xz$	(d) $ab + ac - ad$
(e) $6c^2 - 4cd$	(f) $10x^2 + 15xy$	(g) $12ab + 18bc$	(h) $8xy + 4y^2$
(e) $7de - 9ce$	(f) $24ab^2 + 28ac$	(g) $30xy + 35xyz$	(h) $4abc - 6a$
(i) $8cdf + 10cde$	(j) $7w^2 + 6w + wy$	(k) $8ab^2 - 10ab$	(l) $4xy^2 + 6xy + 2x^2y$
(m) $6mn - 7m^2n$	(n) $11g^2h + 22h^2$		

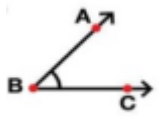
4. Factorise the following expressions:

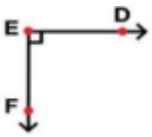
(a) $x^3 + 2x^2$	(b) $5x^3 - x^2$	(c) $8c^3 + 12c$	(d) $10w^2 - 15w^3$
(e) $32y^3 + 24y^2$	(f) $12x^4 + 15x$	(g) $4a^5 - 12a^2$	(h) $8w^9 + w^7$

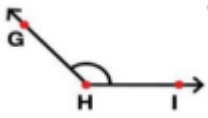
SHAPE AND ANGLES REVISION

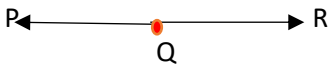
Exercise 1

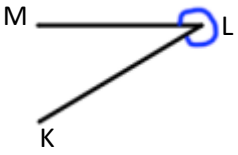
1. State the name of the following angles using 3 letters and the type of angle it is:
   e.g. < EDF is an obtuse angle.

a) 

b) 

c) 

d) 

e) 

2. State the type of each angle below:
   (a) 45° (b)105° (c) 200° (d) 19° (e) 90° (f) 179° (g)318°
   (h) 1° (i) 93° (j) 82° (k) 89° (l) 183°

Exercise 2

1. Write each of the following compass points as three figure bearings:

a) SOUTH is _ _ _ o

b) WEST is _ _ _ o

c) NORTH WEST is _ _ _ o

d) SOUTH WEST is _ _ _ o

e) SOUTH EAST is _ _ _ o

f) NORTH EAST is _ _ _ o

g) NORTH NORTH EAST is _ _ _ o

h) NORTH EAST EAST is _ _ _ o

2. Using the compass points follow the directions to answer each question:
   a) Face North then make a 90° turn clockwise. Which direction are you facing now?
   b) Face South West then make a $\frac{1}{2}$ turn anti-clockwise. Which direction are you facing now?
   c) Face North West the make a $\frac{1}{4}$ turn clockwise. Which direction are you facing now?

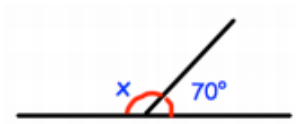
d) Face West the make a 180^0 turn anti-clockwise and then a $\frac{1}{4}$ turn clockwise. Which direction are you facing now?

e) Face South East the make a $\frac{3}{4}$ turn clockwise. What direction am I facing now?

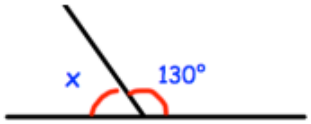
Exercise 3

1. Calculate the size of the missing angles:

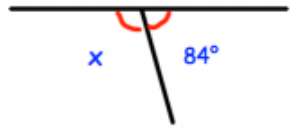
(a)



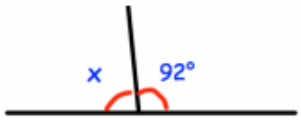
(b)



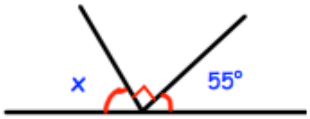
(c)



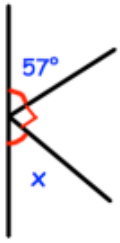
(d)



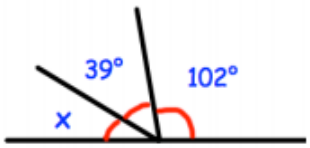
(e)



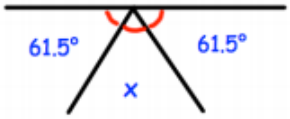
(f)



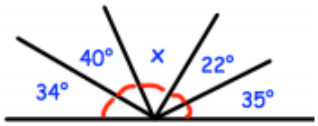
(g)



(h)

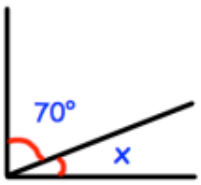


(i)



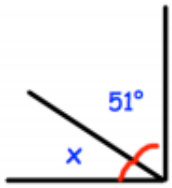
2. Calculate the size of the missing angles:

(a)

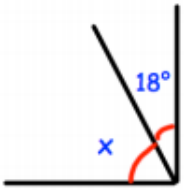


(b)

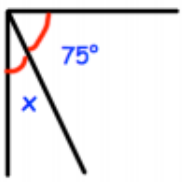
(c)



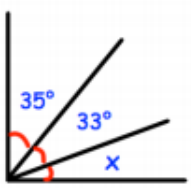
(d)



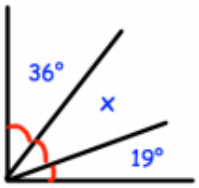
(e)



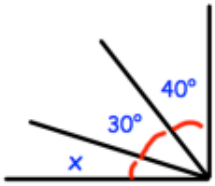
(f)



(g)



(h)

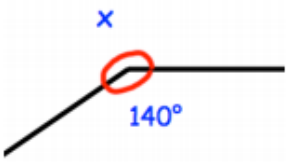


(i)

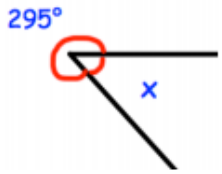
Exercise 4

1. Calculate the size of the missing angles:

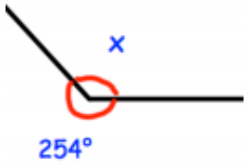
(a)



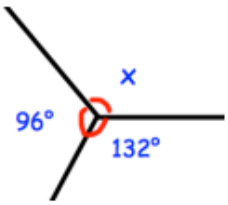
(b)



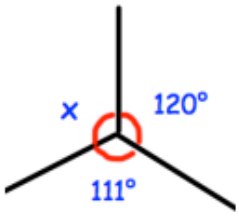
(c)



(d)

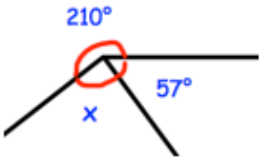


(e)

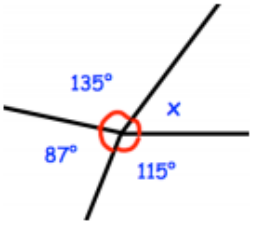


(f)

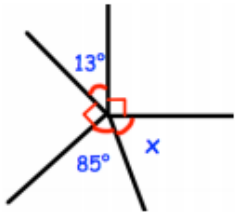
(g)



(h)



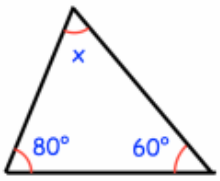
(i)



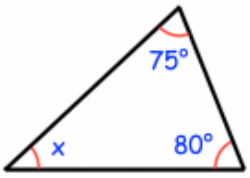
Exercise 5

1. Calculate the size of the missing angles:

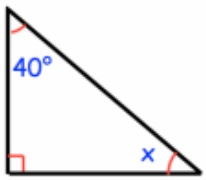
(a)



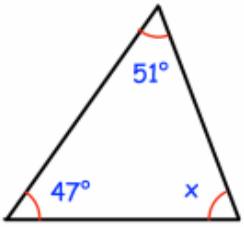
(b)



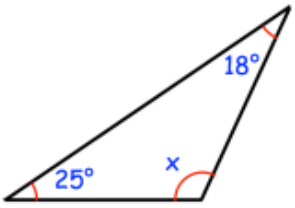
(c)



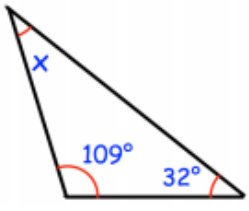
(d)



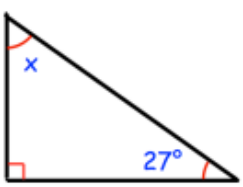
(e)



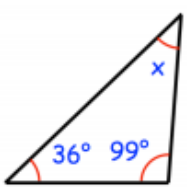
(f)



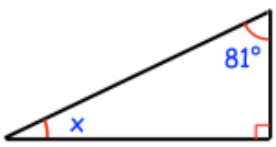
(g)



(h)

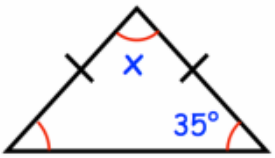


(i)

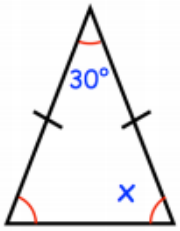


2. Calculate the size of the missing angles:

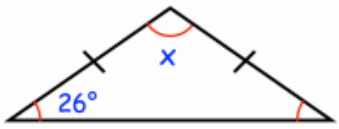
(a)



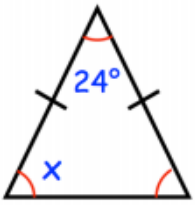
(b)



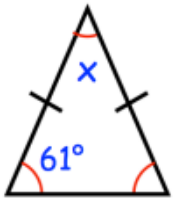
(c)



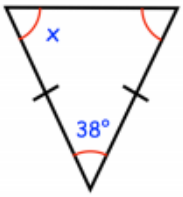
(d)



(e)

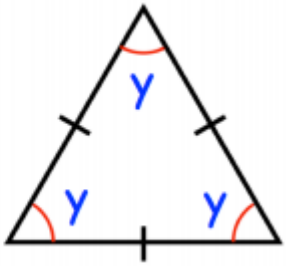


(f)



3.

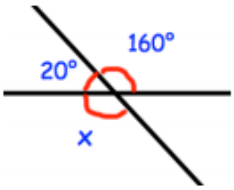
Shown is an equilateral triangle.
Find the size y.



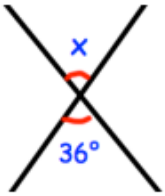
Exercise 6

1. Calculate the size of the missing angles:

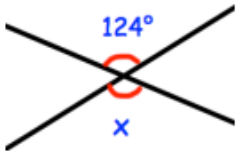
(a)



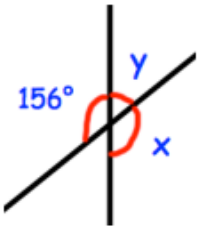
(b)



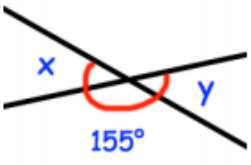
(c)



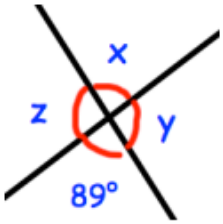
(d)



(e)



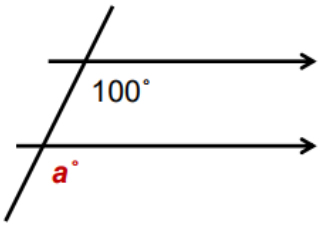
(f)



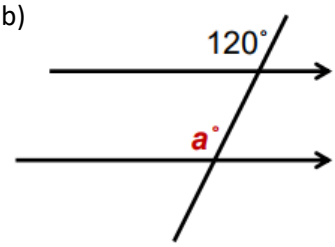
Exercise 7

1. Calculate the size of the missing angles:

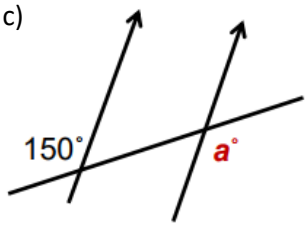
a)



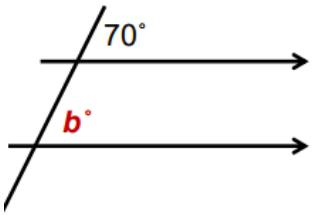
b)



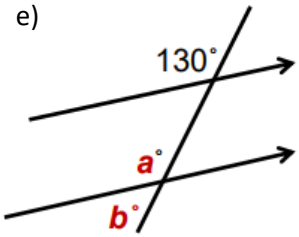
c)



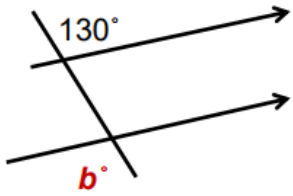
d)



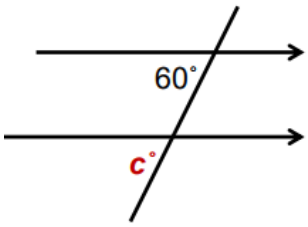
e)



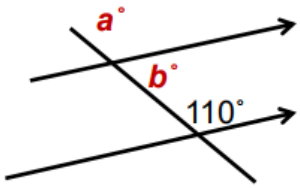
f)



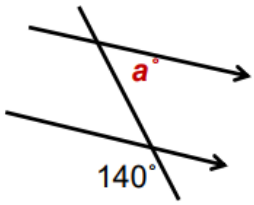
g)



h)



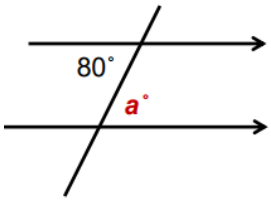
i)



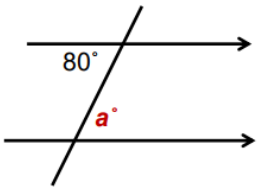
Exercise 8

1. Calculate the size of the missing angles:

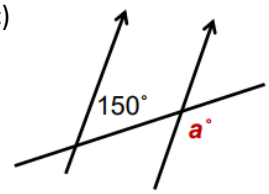
a)



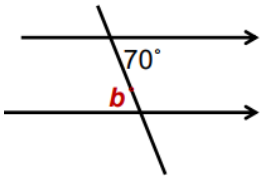
b)



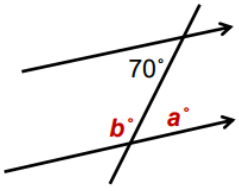
c)



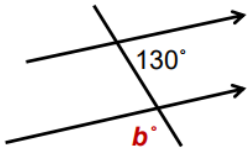
d)



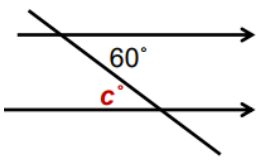
e)



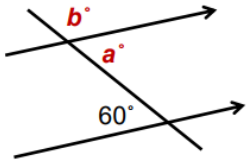
f)



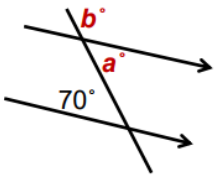
g)



h)



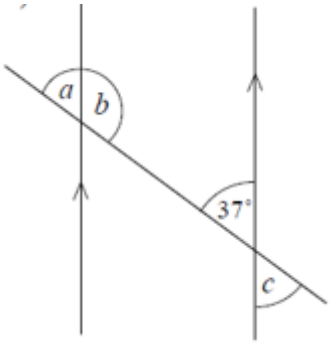
i)



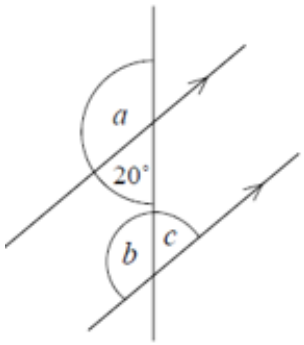
Exercise 9

1. Calculate the size of the missing angles:

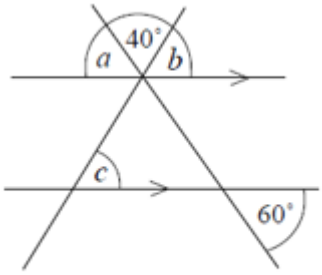
a)



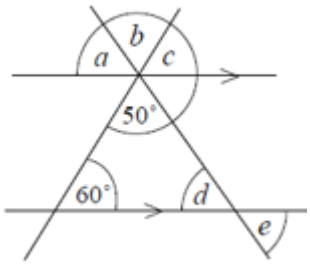
b)



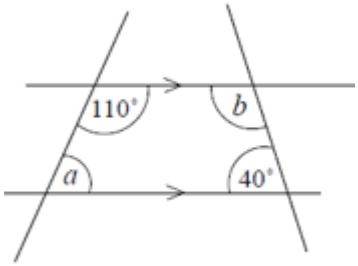
c)



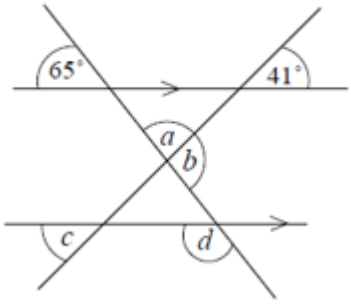
d)



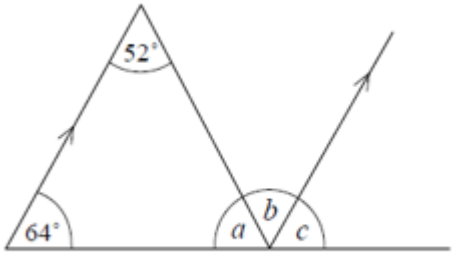
e)



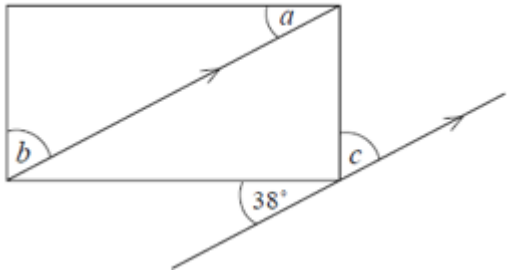
f)



g)



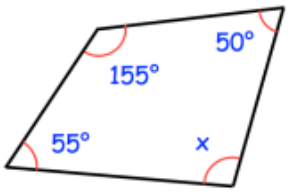
h)



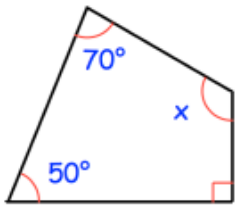
Exercise 10

1. Calculate the size of the missing angles:

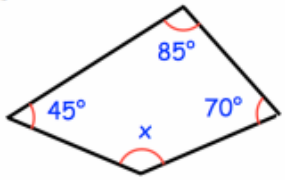
(a)



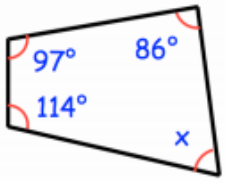
(b)



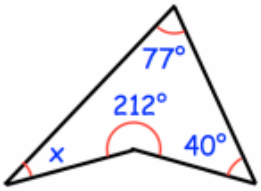
(c)



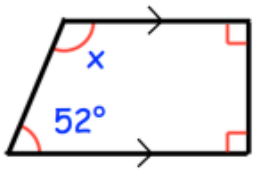
(d)



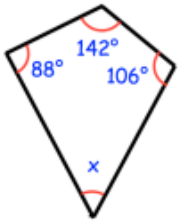
(e)



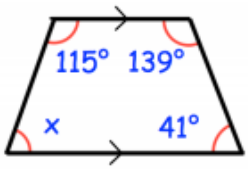
(f)



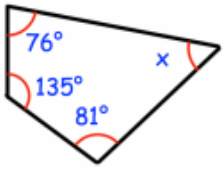
(g)



(h)

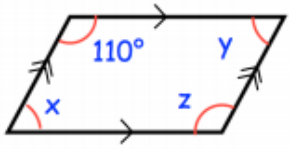


(i)

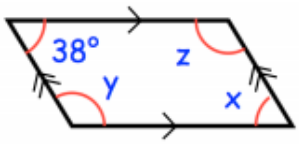


2. Calculate the size of the missing angles:

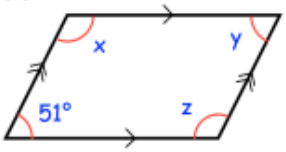
(a)



(b)

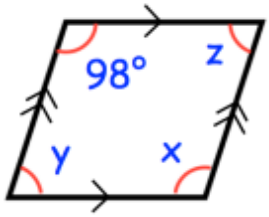


(c)

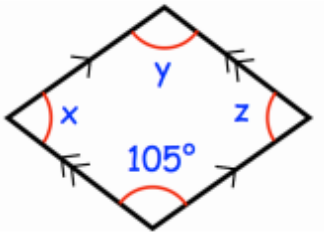


3. Calculate the size of the missing angles:

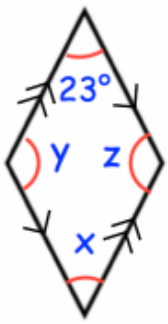
(a)



(b)

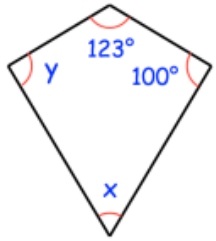


(c)

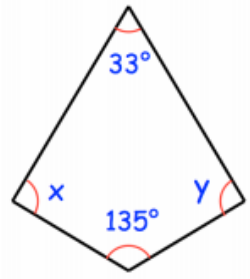


4. Calculate the size of the missing angles:

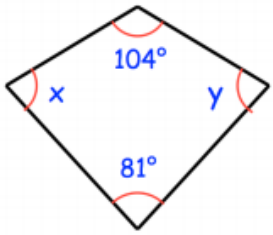
(a)



(b)



(c)



Exercise 11

1. I have 4 equal sides and 4 right angles, what 2D shape am I?
2. I have 6 sides, 6 vertices and all lengths are the same, what 2D shape am I?
3. I have only 1 side and no vertices, what 2D shape am I?
4. I have 4 sides; 2 long and 2 short, and 4 right angles. What 2D shape am I?
5. I have 5 sides, 5 vertices and all lengths are the same, what 2D shape am I?
6. I have 3 sides and 3 vertices, what 2D shape am I?
7. I have 4 sides and 4 vertices. I have one pair of parallel lines, what 2D shape am I?
8. I have 4 sides and 4 vertices. I have two set of parallel lines, what 2D shape am I?

Exercise 12

1. This 3D shape has no flat edges and no straight edges. It has just one curved face. What am I?
2. This 3D shape has 6 faces, 8 vertices and 12 edges. Each face is a rectangle. What am I?
3. This 3D shape has 5 faces, 5 vertices and 8 edges. Four of the faces are triangles. What am I?
4. This 3D shape has 6 faces, 8 vertices and 12 edges. Each face is a square. What am I?
5. This 3D shape has one curved surface and one flat face. The flat face is a circle. What am I?
6. This 3D shape has one curved surface and two flat faces. The flat faces are circles. What am I?
7. This 3D shape has 5 faces, 6 vertices and 9 edges. Three of its faces are rectangular and two are triangles. What am I?