KING EDWARD VI
HANDSWORTH GRAMMAR
SCHOOL FOR BOYS

KING EDWARD VI
ACADEMY TRUST
BIRMINGHAM

Year 11

2026 Mathematics 2027

Unit 25 Tasks

DO NOT WRITE INSIDE

Contents

1 Graph Transformations

What effect will the following transformations have on these points?

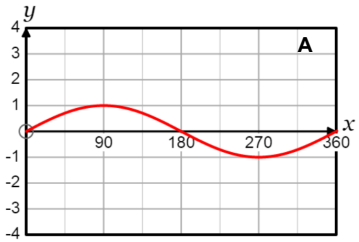
	$y = f(x)$	$(4, 3)$	$(1, 0)$	$(6, -4)$
a	$y = f(x + 1)$	?	?	?
b	$y = f(x) - 1$	?	?	?
c	$y = f(-x)$	?	?	?
d	$y = -f(x)$	?	?	?

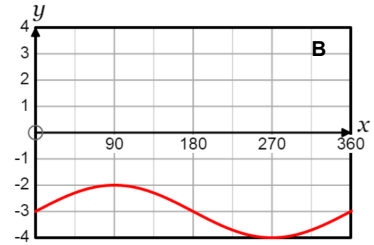
Fluency Practice

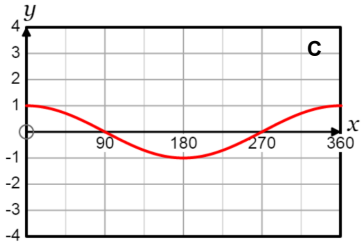
tRiG tRansfORmations

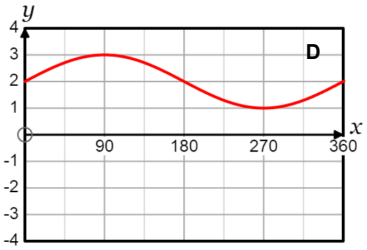
1

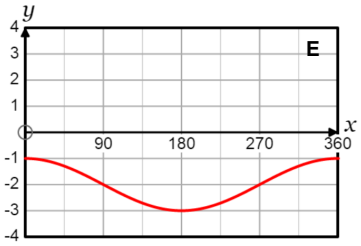
Match the graphs to their equations below.

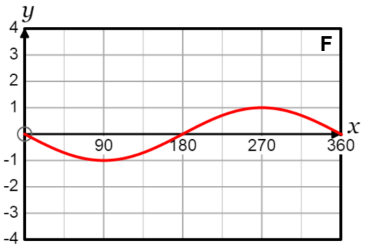


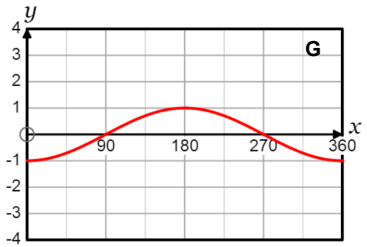


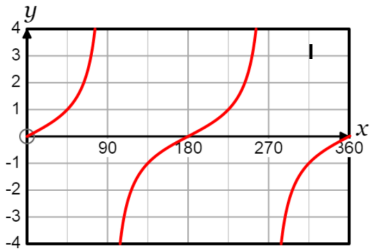


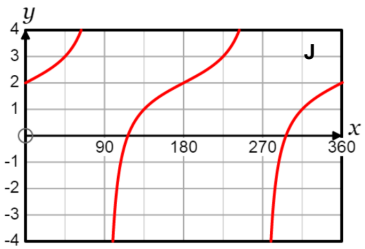


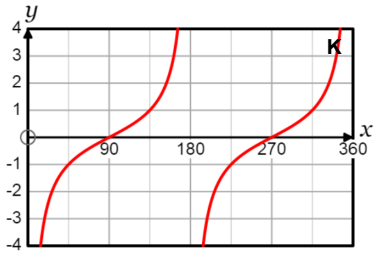


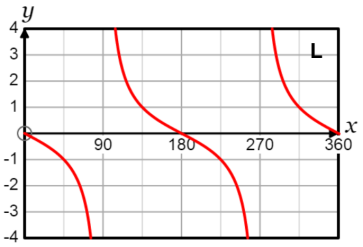












y = -cos(x)

y = -tan(x)

y = -sin(x)

y = sin(x) - 3

y = tan(x - 90)

y = cos(x)

y = tan(x)

y = tan(x) + 2

y = cos(x) - 2

y = sin(x)

y = sin(x) + 2

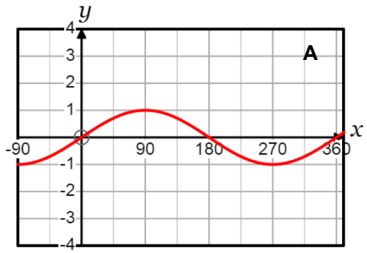
y = cos(x) + 1

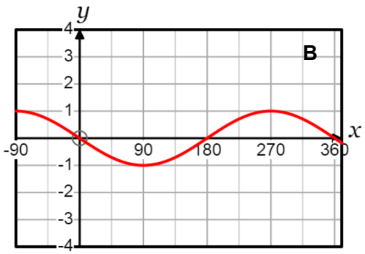
Fluency Practice

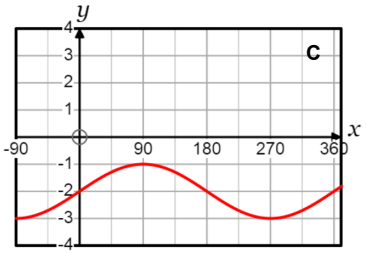
trig transformations

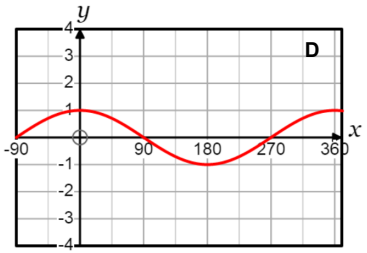
2

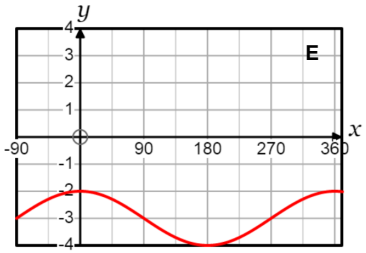
Match the graphs to their equations below.

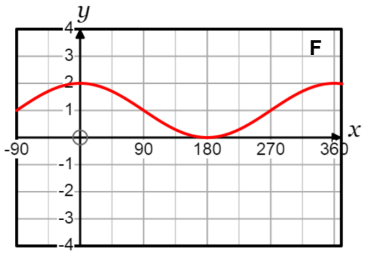


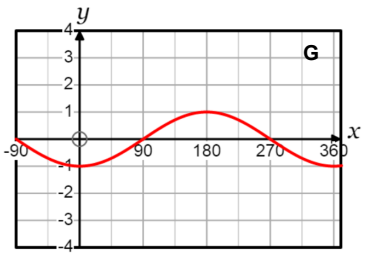


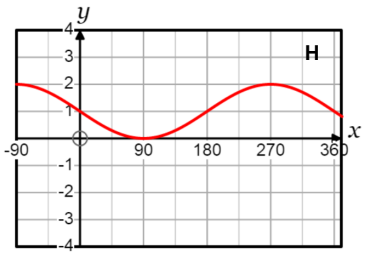


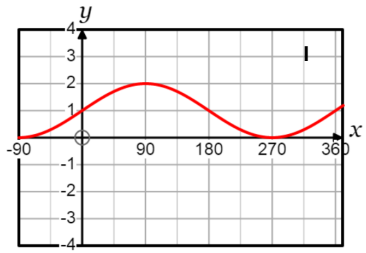


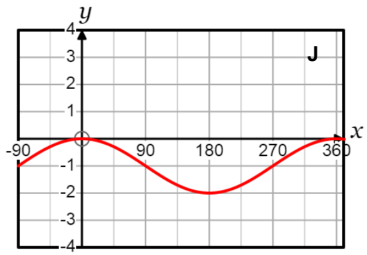


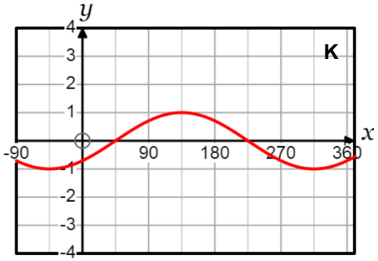


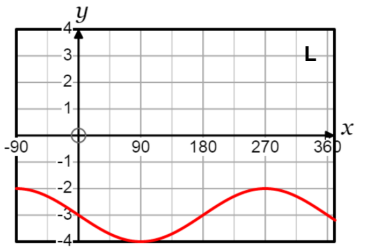












y = sin(-x) - 3

y = sin(x - 45)

y = cos(x - 90) + 1

y = sin(x)

y = -sin(x) + 1

y = cos(x) +1

y = sin(x) - 2

y = cos(x + 180)

y = cos(-x) -1

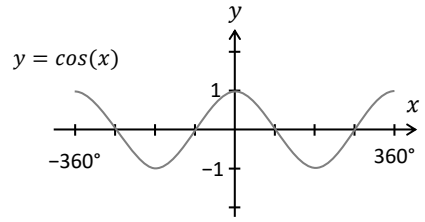
y = cos(x)

y = cos(x) - 3

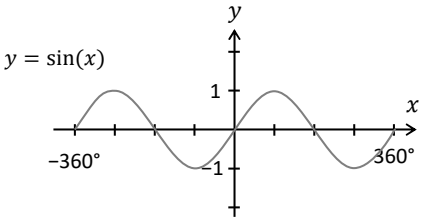
y = sin(x + 180)

Fluency Practice

A) Sketch: $y = cos(x) + 1$



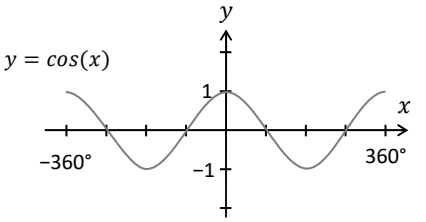
B) Sketch: $y = sin(x) - 1$



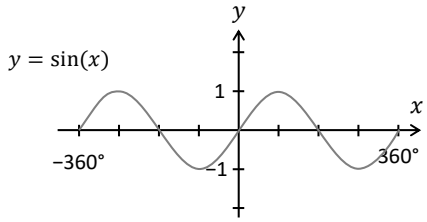
Transforming sin & cos **Graphs**

$y = f(x) + a$ $= \begin{pmatrix} 0 \\ a \end{pmatrix}$	$y = f(x - a)$ $= \begin{pmatrix} a \\ 0 \end{pmatrix}$
$y = -f(x)$ Reflection in x axis.	$y = f(-x)$ Reflection in y axis.

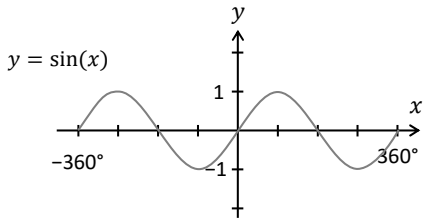
C) Sketch: $y = cos(x - 90)$



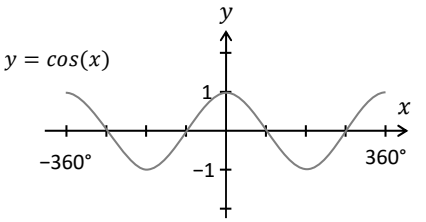
D) Sketch: $y = sin(x + 90)$



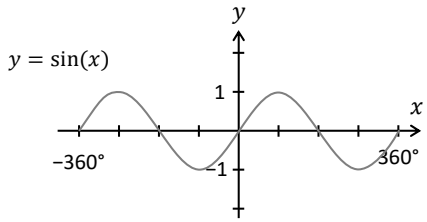
E) Sketch: $y = sin(x - 30)$



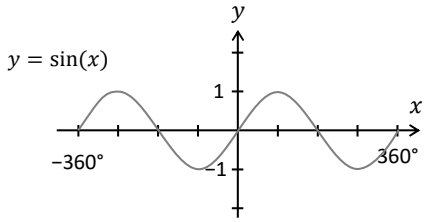
F) Sketch: $y = -cos(x)$



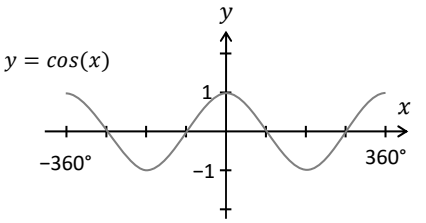
G) Sketch: $y = sin(-x)$



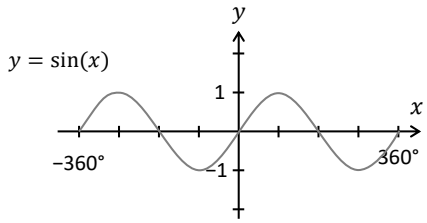
H) Sketch: $y = -sin(-x)$



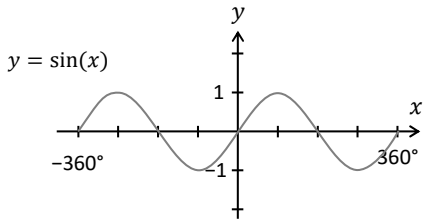
I) Sketch: $y = cos(x - 30) + 1$



J) Sketch: $y = -sin(x + 180)$



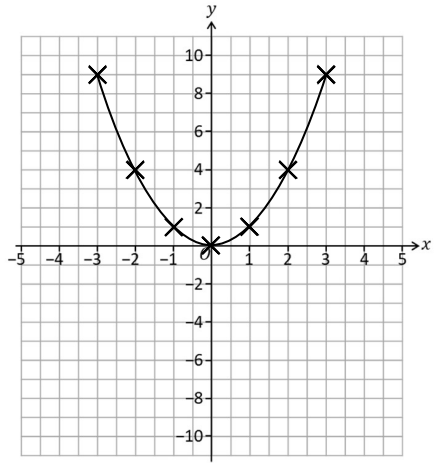
K) Sketch: $y = sin(-x + 30) - 1$



Fluency Practice

Transforming Graphs

① The graph $y = x^2$ has been plotted.
We will **transform** it by adding 2 to the function **output**.
Complete the table of values & plot the graph.



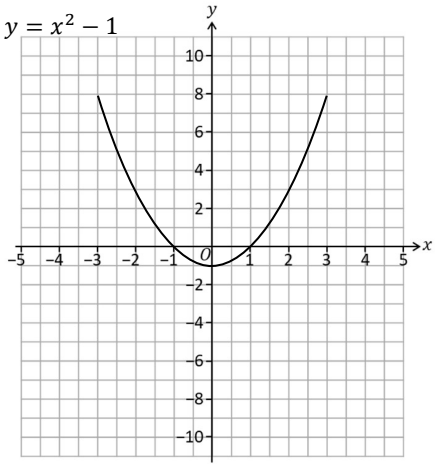
$f(x) = x^2$

x	$f(x)$	$f(x)+2$
3	9	11
2	4	6
1	1	
0	0	
−1	1	
−2	4	
−3	9	

Describe how the original graph has moved (transformed).

② We will **transform** this graph by adding 2 to the function **input**.
Complete the table of values & plot the graph.

$y = x^2 - 1$



$f(x) = x^2 - 1$

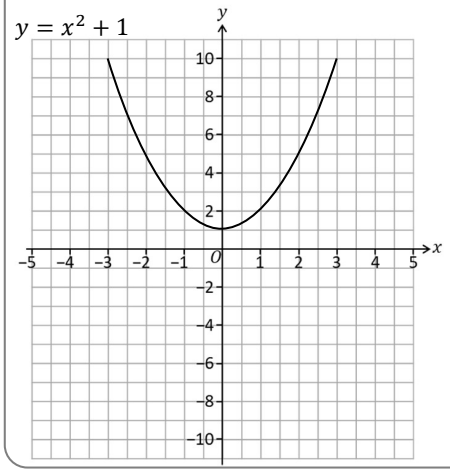
x	$f(x)$	$x+2$	$f(x+2)$
3	8	5	24
2	3	4	15
1	0	3	8
0	−1	2	
−1	0		
−2	3		
−3	8		
−4	15		
−5	24		

Describe how the original graph has been transformed.

change + to −, or − to +

③ We will **transform** this graph by taking the negation of the **output**.

$y = x^2 + 1$

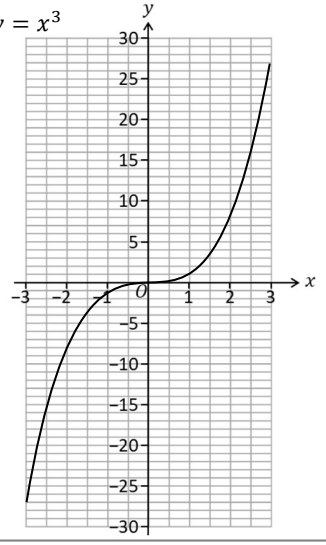


$f(x) = x^2 + 1$

x	$f(x)$	$-f(x)$
3	10	−10
2	5	
1	2	
0	1	
−1	2	
−2	5	
−3	10	

Describe how the original graph has been transformed.

④ $y = x^3$



We will **transform** this graph by taking the negation of the **input**.

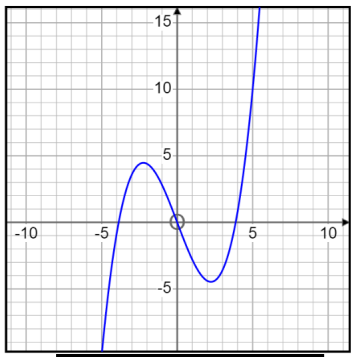
$f(x) = x^3$

x	$f(x)$	$-x$	$f(-x)$
3	27	−3	
2	8		
1	1		
0	0		
−1	−1		
−2	−8		
−3	−27		

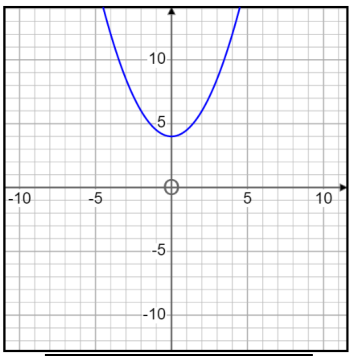
Describe how the original graph has been transformed.

transformations

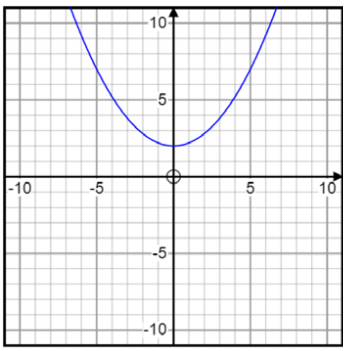
On each grid, y = f(x) is drawn.
Sketch the graph of the transformation indicated.



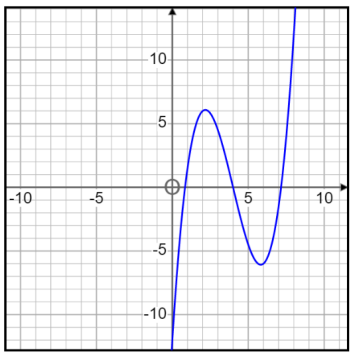
y = f(x) + 5



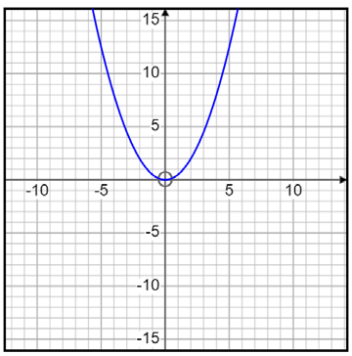
y = -f(x)



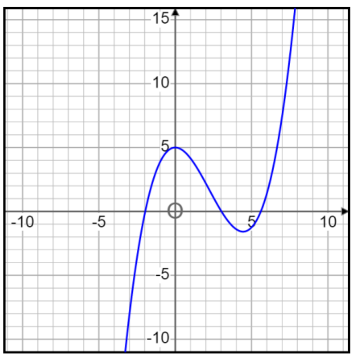
y = f(x + 3)



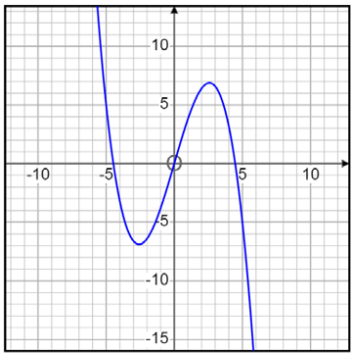
y = f(-x)



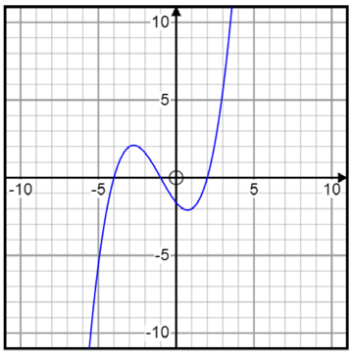
y = f(x-3)



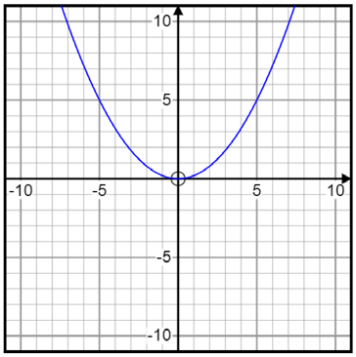
y = f(x+3)



y = f(x - 3) - 4



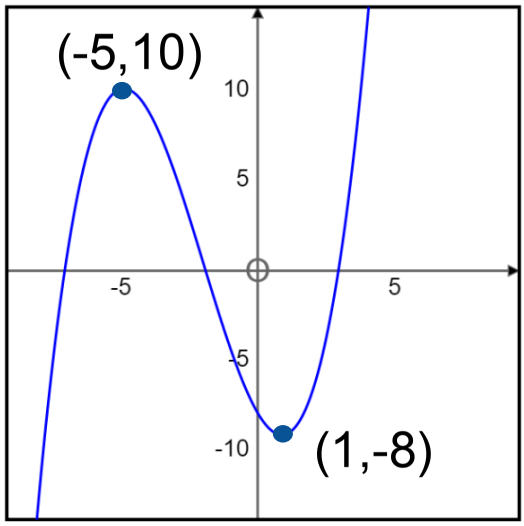
y = f(x - 3) + 4



y = -f(x - 5)

transformed functions

The minimum and maximum points of y = f(x) are shown.
Work out the maximum and minimum points after each of the transformations below.



y = f(x)

y = f(-x)
Max:
Min:

y = f(x) + 2
Max:
Min:

y = f(x - 2)
Max:
Min:

y = -f(x)
Max:
Min:

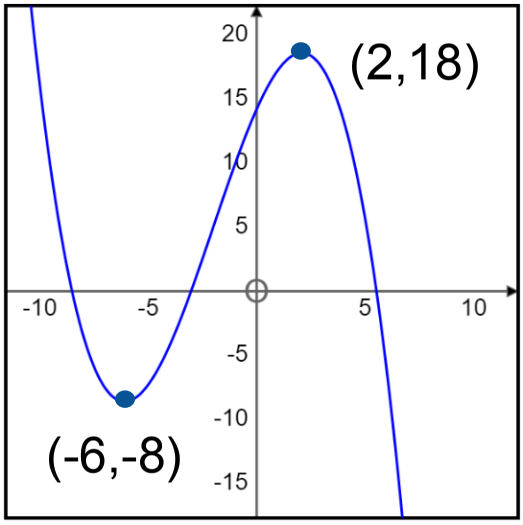
The boxes contain the minimum and maximum points of a transformation of y = f(x). Work out the equation of each of these transformations.

.....
Max: (3,18)
Min: (-5,-8)

.....
Max: (2, 23)
Min: (-6, -3)

.....
Max: (5, 18)
Min: (-3, -8)

.....
Max: (-1, 18)
Min: (-9, -8)

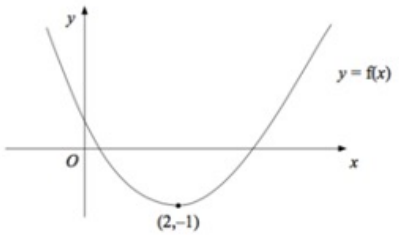


y = f(x)

Fluency Practice

Q	$A\ (3,4)$ is a point on $y = f(x)$. Work out the new coordinates of A	Answers	Q	$A\ (-5,2)$ is a point on $y = f(x)$. Work out the new coordinates of A	Answers
1	$y = f(x) + 1$		13	$y = f(x) + 3$	
2	$y = f(x) - 1$		14	$y = f(x) - 3$	
3	$y = f(x + 1)$		15	$y = f(x + 3)$	
4	$y = f(x - 1)$		16	$y = f(x - 3)$	
5	$y = -f(x)$		17	$y = -f(x)$	
6	$y = f(-x)$		18	$y = f(-x)$	
7	$y = f(x + 2) - 5$		19	$y = f(x + 4) - 1$	
8	$y = f(x - 2) + 5$		20	$y = f(x - 1) + 4$	
9	$y = -f(x - 5) + 2$		21	$y = -f(x - 4) + 1$	
10	$y = -f(x + 5) - 2$		22	$y = -f(x + 1) - 4$	
11	$y = -f(-x) - 7$		23	$y = -f(-x) - 7$	
12	$y = f(x + a) + b$		24	$y = f(x - a) - b$	

Question 1



The diagram shows part of the curve with equation $y = f(x)$.The minimum point of the curve is at (2,–1)

Write down the coordinates of the minimum point of the curve with equation $y = f(x + 2)$

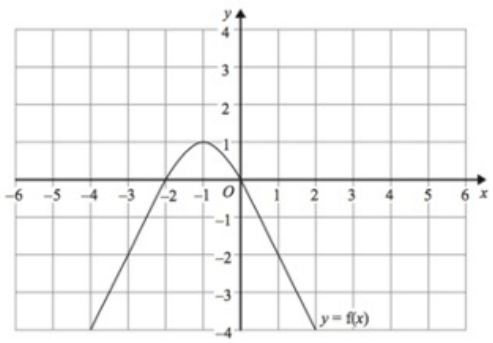
Question 4

The curve with equation $y = f(x)$ has a maximum point at $(2, -7)$.

Find the coordinates of the minimum point of the curve with equation $y = -f(x)$

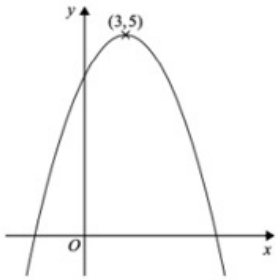
Question 6

The graph of $y = f(x)$ is shown on the grid.



The graph of $y = f(x)$ has a turning point at the point $(-1,1)$. Write down the coordinates of the turning point of the graph of $y = f(-x) + 2$

Question 7



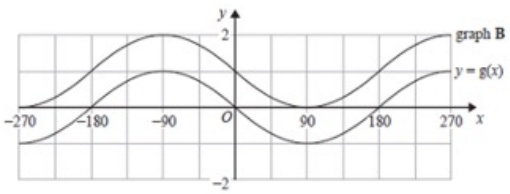
The diagram shows part of the curve with equation $y = f(x)$ The coordinates of the maximum point of the curve are $(3,5)$. The curve with equation $y = f(x)$ is transformed to give the curve with equation

$$y = f(x) - 4$$

Describe the transformation.

Question 8

The graph of $y = g(x)$ is shown on the grid.

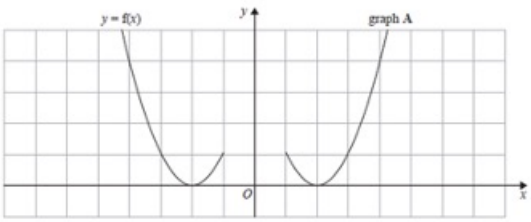


Graph B is a translation of the graph of $y = g(x)$.

Write down the equation of graph B.

Question 9

The graph of $y = f(x)$ is shown on the grid.

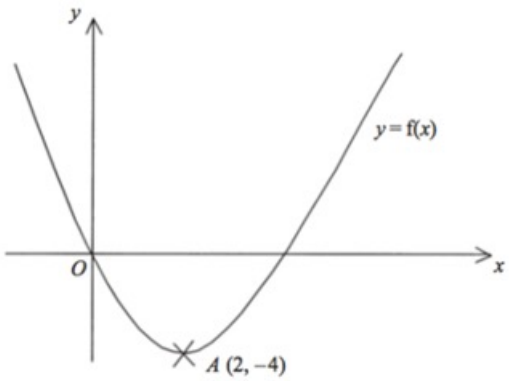


Graph A is a reflection of the graph of $y = f(x)$.

Write down the equation of graph A.

Question 10

This is a sketch of the curve with equation $y = f(x)$.
It passes through the origin O.



The only vertex of the curve is at $A(2, -4)$.

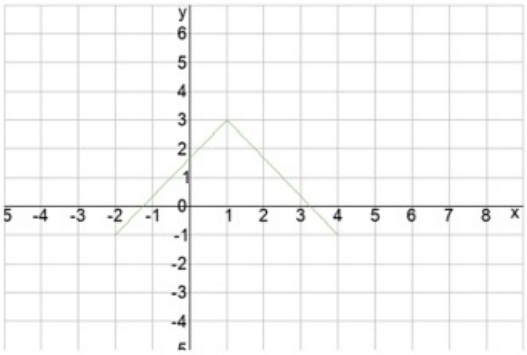
The curve with equation $y = x^2$ has been translated to give the curve $y = f(x)$.

Find $f(x)$ in terms of x.

Question 12

Here is the graph of $y = f(x)$

On the grid, draw the graph of $y = f(-x)$



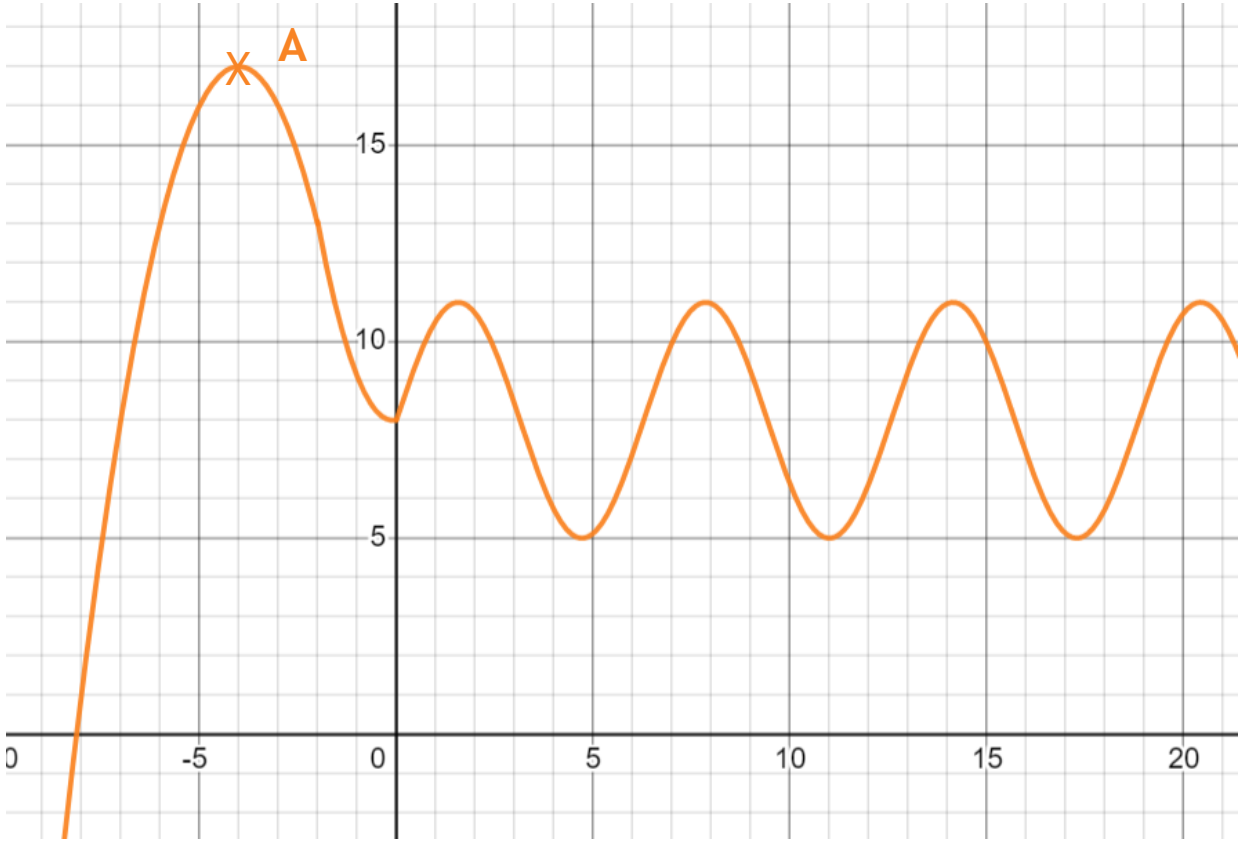
Question 13

The coordinates of the turning point of the graph of $y = x^2 - 8x + 25$ is $(4,9)$.

Hence describe the single transformation which maps the graph of $y = x^2$ onto the graph of $y = x^2 - 8x + 25$.

Fluency Practice

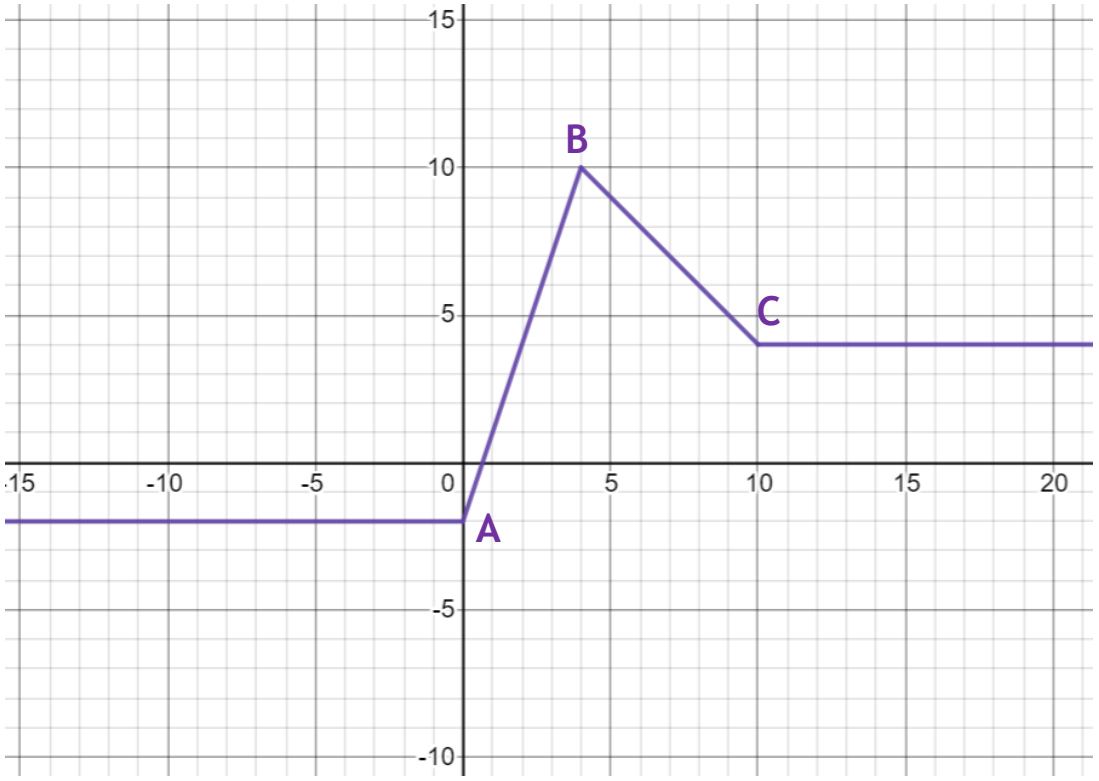
The graph shows the function $g(x)$



Transformation	Point A is now at ____
$g(x-7)$	
	$(-11, 17)$
$g(x)+7$	
$-g(x)$	
	$(4, -17)$
$g(-x)+7$	
$g(-x)-3$	
	$(2, 16)$
$-g(4-x)+2$	

Purposeful Practice

The graph shows the function, $f(x)$



1) Find length AC

2) Find the angle AB makes with the y-axis

3) Find the midpoint of BC

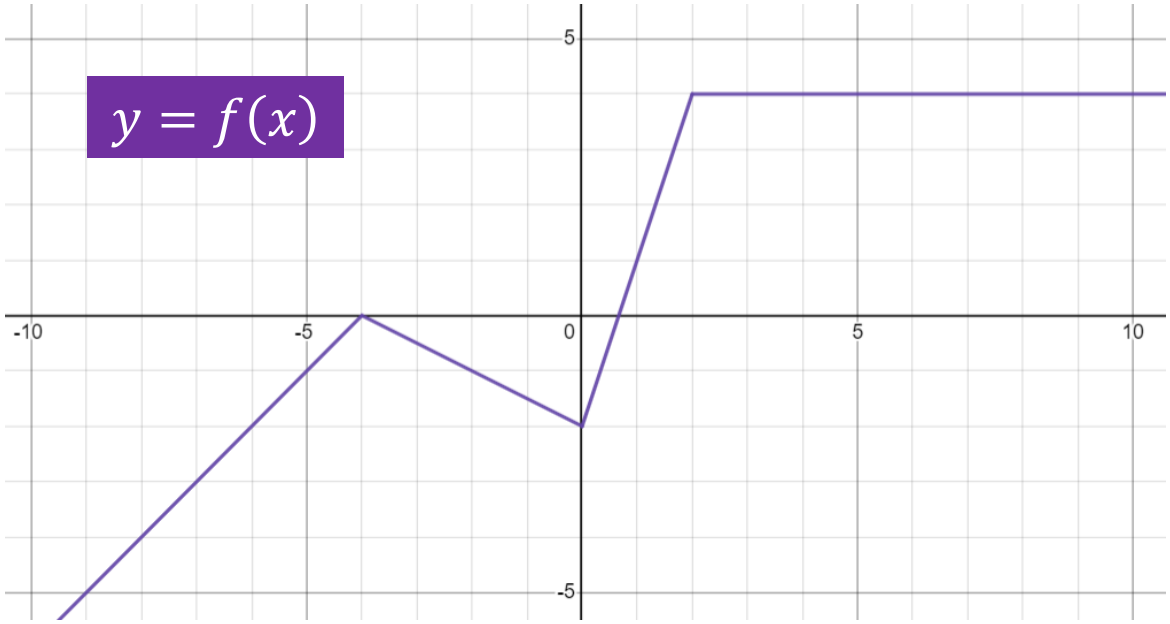
4) Sketch the following functions and write down the coordinates of A, B and C after the transformation:

a) $y = f(x) - 5$
b) $y = f(x - 5)$
c) $y = -f(x) + 5$
d) $y = f(x + 5)$
e) $y = f(5 - x)$
f) $y = -f(x + 2) - 1$
g) $y = -(f(x + 2) - 1)$

5) Find the area between $f(x)$ and the line $y = \frac{3}{5}x - 2$

6) Line segment BD is perpendicular to AB and intersects $f(x)$. Find the length of BD.

Fluency Practice



Sketch each translated graph:

$y - 4 = f(x)$

$y = f(x - 3) - 2$

$y = f(x - 4)$

$y = f(3 + x) + 2$

$y + 4 = f(x - 4)$

$y + 3 = f(x) + 4$

Fluency Practice

Match each vector representation with its equivalent translation in function notation.

Transformations in function notation			Vectors		
$y-3=f(x+2)$	$y=f(x+3)+3$	$y=f(x-3)+2$	$\begin{pmatrix}-2\\3\end{pmatrix}$	$\begin{pmatrix}1\\0\end{pmatrix}$	$\begin{pmatrix}-3\\2\end{pmatrix}$
$y-2=f(x)-3$	$y+2=f(x-3)$	$1+y=f(2+x)$	$\begin{pmatrix}3\\-2\end{pmatrix}$	$\begin{pmatrix}-2\\-1\end{pmatrix}$	$\begin{pmatrix}-1\\0\end{pmatrix}$
$y=f(1+x)+2$	$y+2=f(x-3)$	$y-2=f(3+x)$	$\begin{pmatrix}3\\2\end{pmatrix}$	$\begin{pmatrix}0\\2\end{pmatrix}$	$\begin{pmatrix}2\\0\end{pmatrix}$
$y=1+f(x)$	$y+3=f(x-2)+3$	$y=f(x-2)+3$	$\begin{pmatrix}-3\\3\end{pmatrix}$	$\begin{pmatrix}3\\-2\end{pmatrix}$	$\begin{pmatrix}2\\3\end{pmatrix}$
$y=f(x)+2$	$y+2=f(1+x)+2$	$y=f(1+x-2)$	$\begin{pmatrix}0\\-1\end{pmatrix}$	$\begin{pmatrix}0\\1\end{pmatrix}$	$\begin{pmatrix}-1\\2\end{pmatrix}$
	$y=f(x-2)-3$			$\begin{pmatrix}2\\-3\end{pmatrix}$	

2 Congruence and Similarity Proofs

Conditions for Congruent Triangles

1. **SSS** (side, side, side)
   All three corresponding sides are equal in length.
2. **SAS** (side, angle, side)
   A pair of corresponding sides and the included angle are equal.

3. **ASA** (angle, side, angle)
   A pair of corresponding angles and the included side are equal.

4. **AAS** (angle, angle. corresponding side)
   A pair of corresponding angles and a non-included side are equal (the non-included side must be opposite one of the equal angles).

5. **RHS** (Right-angled triangle, hypotenuse, side)
   Two right-angled triangles are congruent if the hypotenuse and one side are equal.

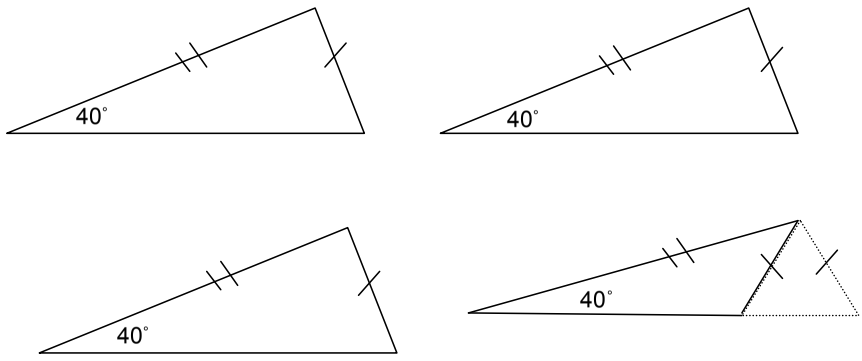
NOTES:

1. AAA does not work.

If all the corresponding angles of a triangle are the same, the triangles will be the same shape, but not necessarily the same size. **The triangles are said to be similar.**

2. SSA also does not work.

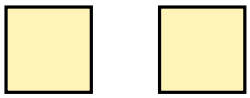
Given two sides and a non-included angle, it is possible to draw two different triangles that satisfy the values. It is therefore not sufficient to prove congruence.



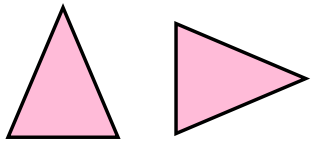
Diagrams not drawn to scale

Question 1: For each pair of shapes, state whether they are congruent or not congruent

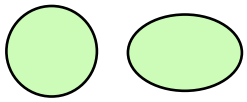
(a)



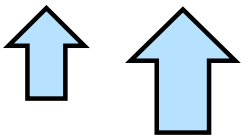
(b)



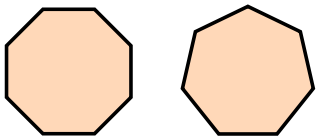
(c)



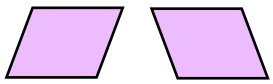
(d)



(e)

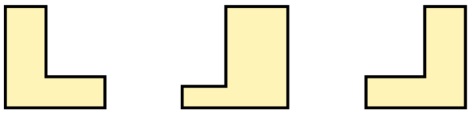


(f)

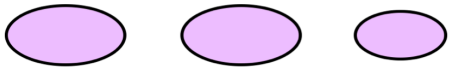


Question 2: Write down the shape that is not congruent to the others

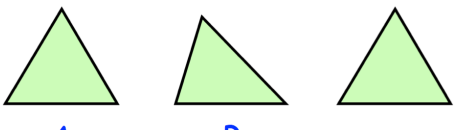
(a)



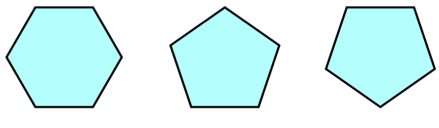
(b)



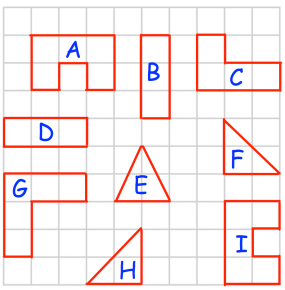
(c)



(d)

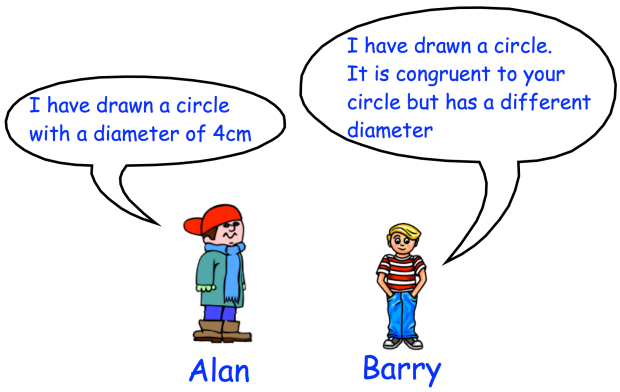


Question 3: Which pairs of shapes on the grid are congruent?



Apply

Question 1: Can Barry be correct?
Explain your answer.

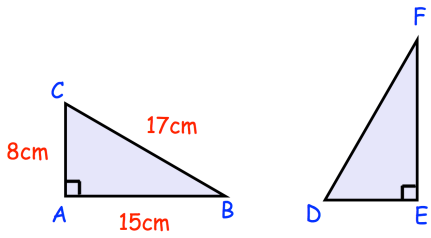


Question 2: Triangles ABC and DEF are congruent.

(a) Write down the length of DF

(b) Write down the length of AC

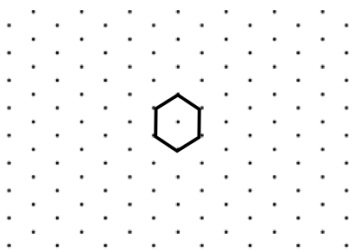
(c) Write down the length of DE



Question 3: Triangles A and B are congruent.
Tick the correct boxes.

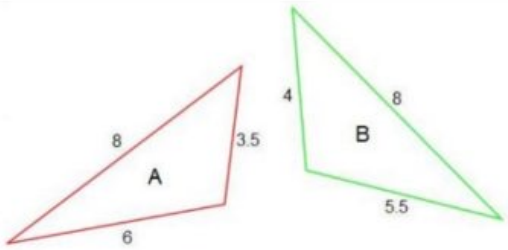
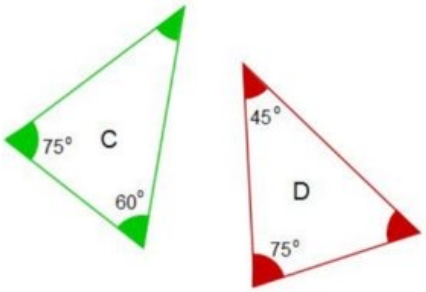
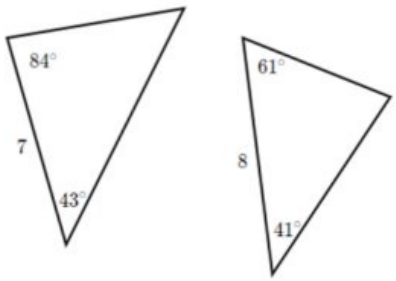
	True	False	Maybe
If Triangle A is isosceles, Triangle B has to be isosceles.	☐	☐	☐
Triangles A and B have different size angles	☐	☐	☐
Triangle A has a larger area than Triangle B	☐	☐	☐

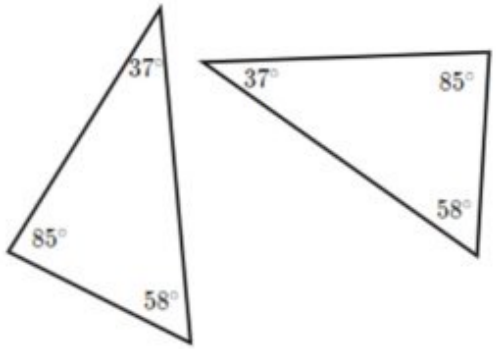
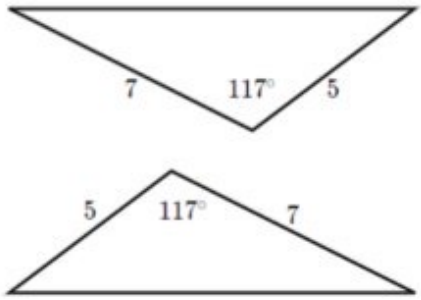
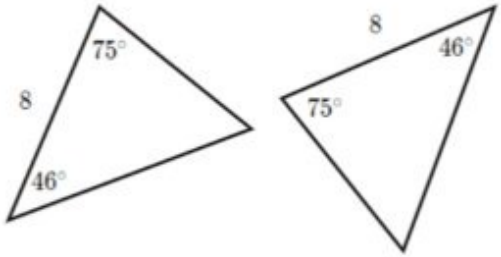
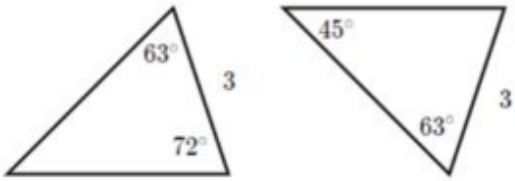
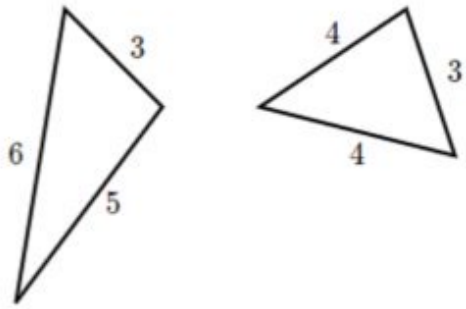
Question 4: A regular hexagon is drawn below.
Draw at least 8 more congruent hexagons
to show the hexagon tessellates.



Exactly the same size and shape. All lengths and angles are the same.

For each of these pairs of triangles decide if they are Congruent, not congruent or there is not enough information

	Congruent Not congruent Not enough information
	Congruent Not congruent Not enough information
	Congruent Not congruent Not enough information

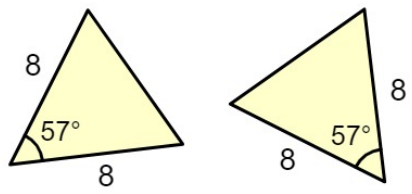
	Congruent Not congruent Not enough information
	Congruent Not congruent Not enough information
	Congruent Not congruent Not enough information
	Congruent Not congruent Not enough information
	Congruent Not congruent Not enough information

congruent triangles

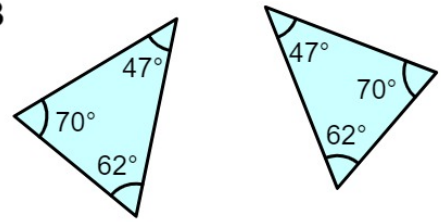
Diagrams are not drawn accurately

Are each pair of triangles congruent?
For each pair, decide whether...
- they are congruent, giving a reason (SSS, ...)
- they are not congruent
- there is not enough information to decide

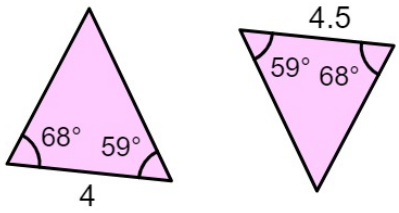
A



B



C



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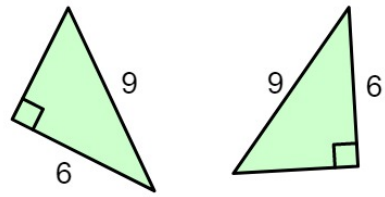
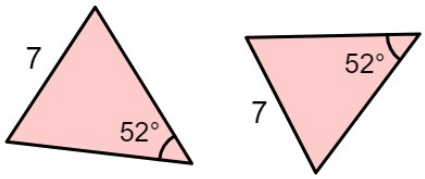
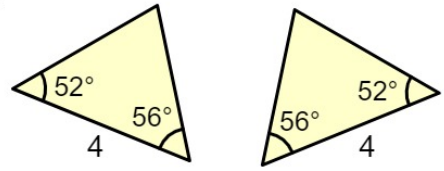


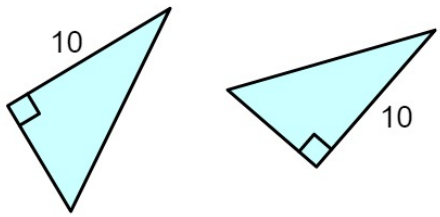
E



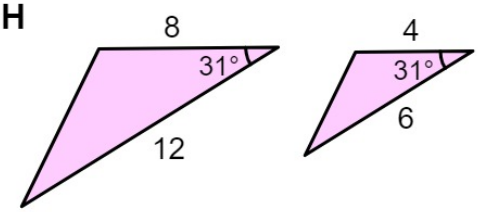
F



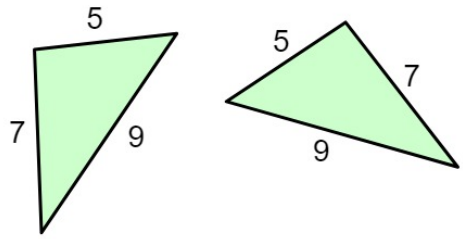
G



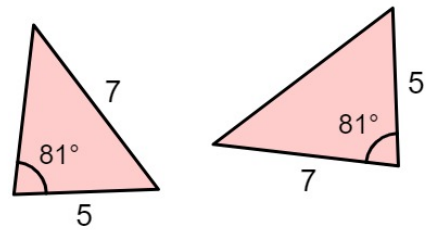
H



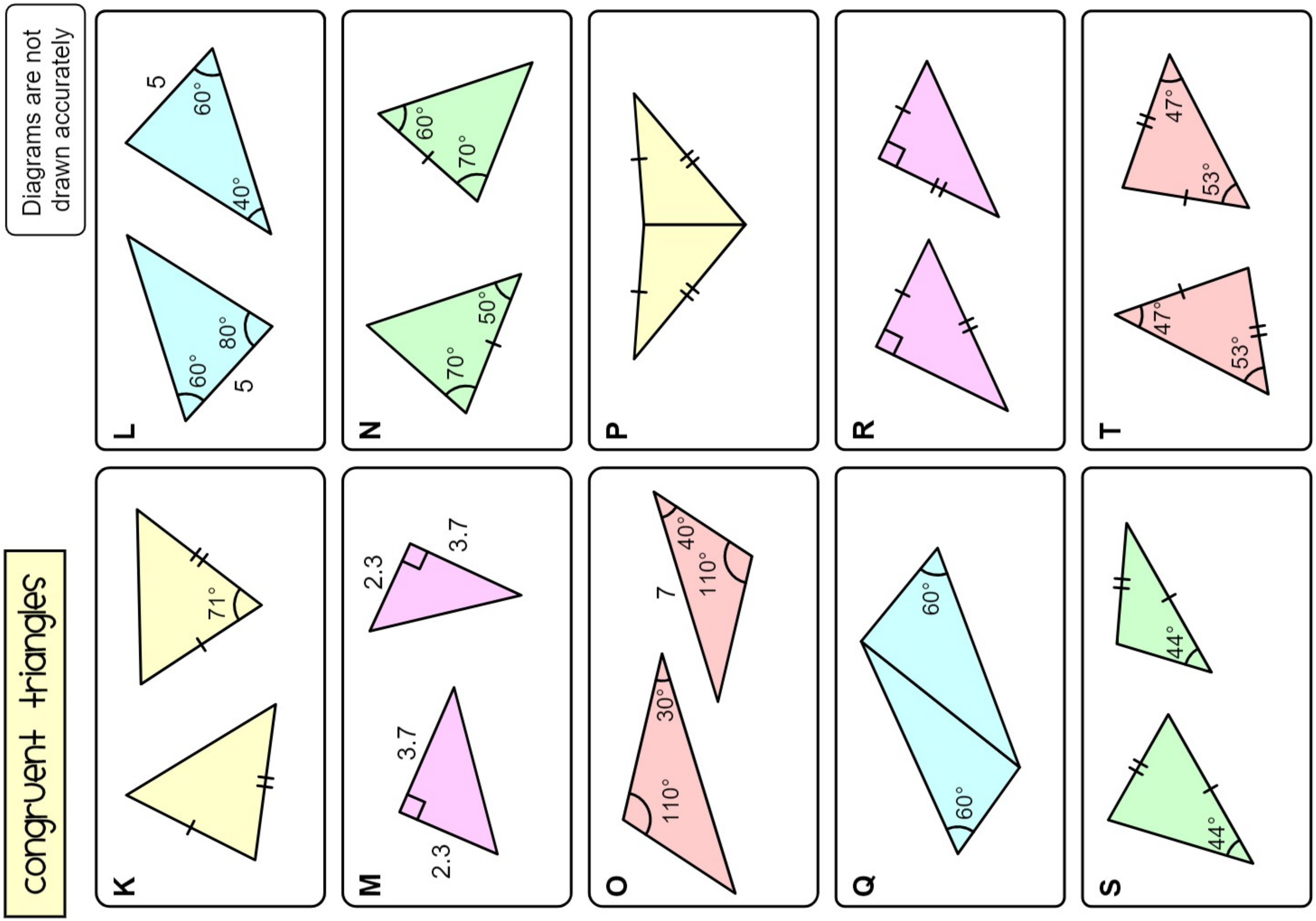
I



J

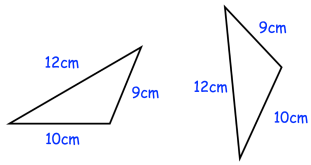


Fluency Practice

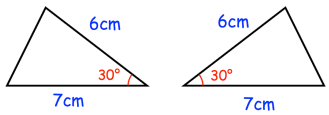


Question 1: The following pairs of triangles are congruent, state the condition that shows they are congruent.

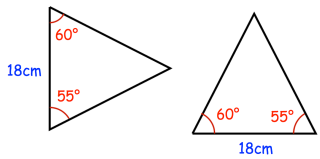
(a)



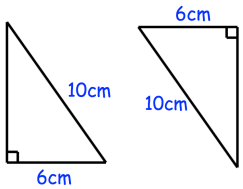
(b)



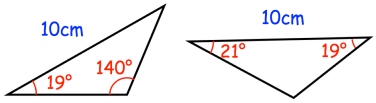
(c)



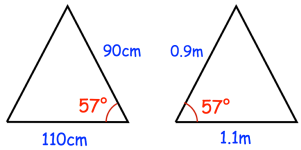
(d)



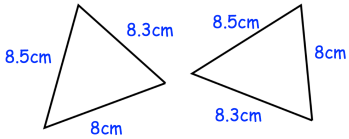
(e)



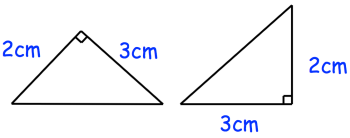
(f)



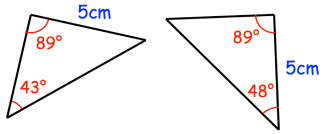
(g)



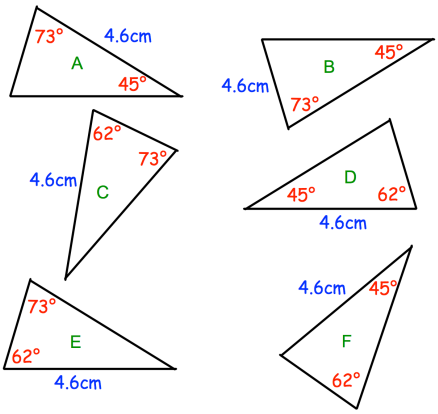
(h)



(i)



Question 2: Shown are six triangles.
Which triangles are congruent?



Question 3: In triangle ABC, AB = 7cm, ∠BAC = 50° and ∠ABC = 35°
In triangle DEF, EF = 7cm, ∠DEF = 35° and ∠DFE = 50°
Are triangles ABC and DEF congruent? If they are, state the condition.

Question 4: In triangle GHI, GH = 7cm, HI = 4cm and GI = 5cm.
In triangle JKL, JK = 7cm, KL = 4.5cm and JL = 5cm.
Are triangles GHI and JKL congruent? If they are, state the condition.

Question 5: In triangle MNO, ∠MNO = 50°, ∠NOM = 60° and ∠OMN = 70°
In triangle PQR, ∠PQR = 50°, ∠QRP = 60° and ∠RPQ = 70°
Are triangles MNO and PQR congruent? If they are, state the condition.

Question 6: In triangle STU, SU = 13cm, ∠TSU = 20° and ∠TUS = 30°
In triangle VWX, WX = 13cm, ∠WXV = 30° and ∠XVW = 20°
Are triangles STU and VWX congruent? If they are, state the condition.

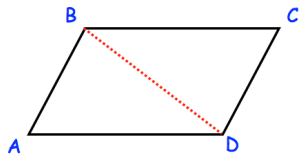
Apply

Question 1: Hannah and Chris each draw a triangle with one side of 3cm, one angle of 35° and one angle of 80°.
Hannah says their triangles **must** be congruent.
Is Hannah correct?

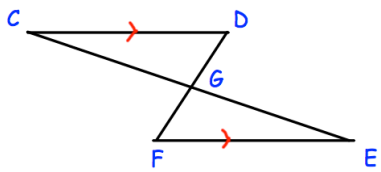
Question 2: Paul and Greg each draw a triangle with one side of 3cm, one side of 9cm and one side of 10cm.
Greg says their triangles **must** be congruent.
Is Greg correct?

Question 3: Carl and Michael each draw a triangle with one angle of 58°, one angle of 68° and one angle of 54°.
Carl says their triangles **must** be congruent.
Is Carl correct?

Question 4: ABCD is a parallelogram.
Prove that triangles ABD and BCD are congruent.

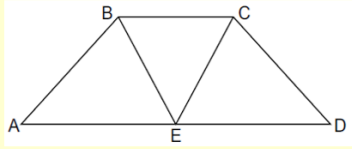


Question 5: In the diagram, the lines CE and DF intersect at G.
CD and FE are parallel and CD = FE.
Prove that triangles CDG and EFG are congruent.



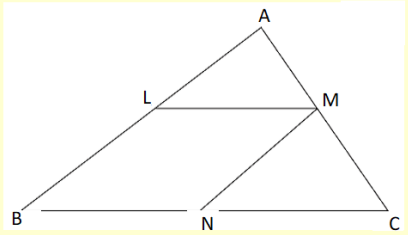
Purposeful Practice

1) The diagram shows **trapezium** $ABCD$.
E is the **midpoint** of AD.
BCE is an **equilateral** triangle.



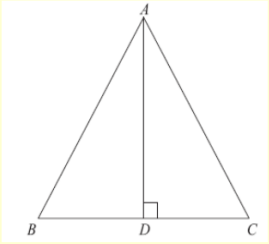
Prove that the triangle ABE is congruent to triangle DCE

2) The diagram shows a triangle ABC.
$LMNB$ is a **parallelogram** where
L is the **midpoint** of AB,
M is the **midpoint** of AC,
and N is the **midpoint** of BC.



Prove that triangle ALM and triangle MNC are congruent.
You must give reasons for each stage of your proof.

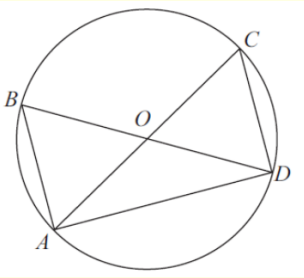
3) ABC is an **equilateral** triangle.
D lies on BC.
AD is **perpendicular** to BC.



a. Prove that triangle ADC is congruent to triangle ADB.

b. Hence, prove that $BD = \frac{1}{2}AB$

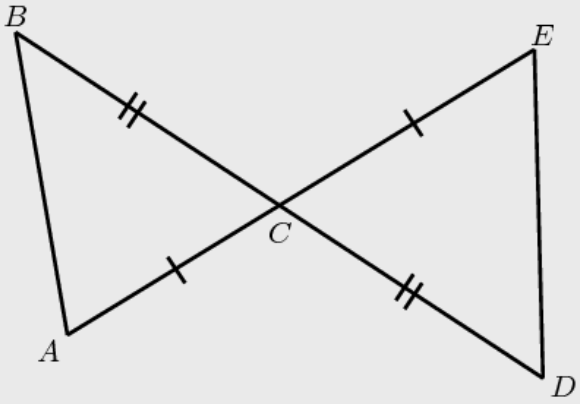
4) AOC and BOD are **diameters** of a circle, **centre** O.
Prove that triangle ABD and triangle DCA are congruent



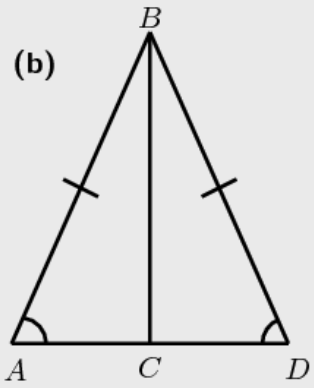
Fluency Practice

State whether the following pairs of triangles are congruent or not. Give reasons for your answers. If there is not enough information to make a decision, explain why.

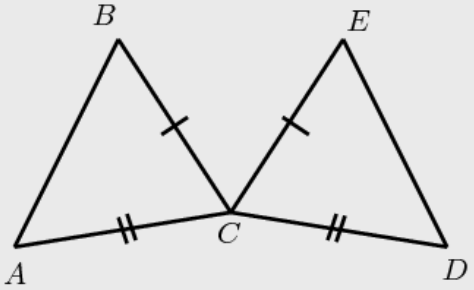
(a)



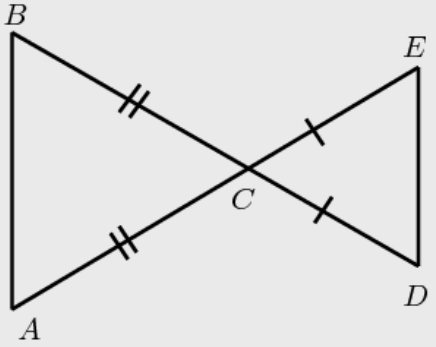
(b)



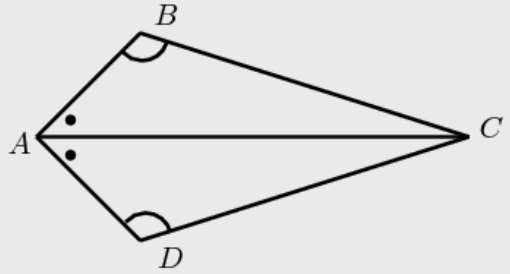
(c)



(d)



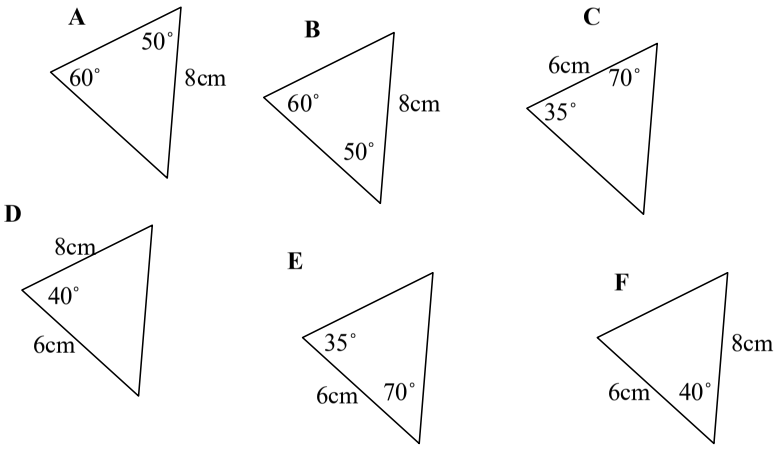
(e)



NOTE: ALL DIAGRAMS **NOT** DRAWN TO SCALE.

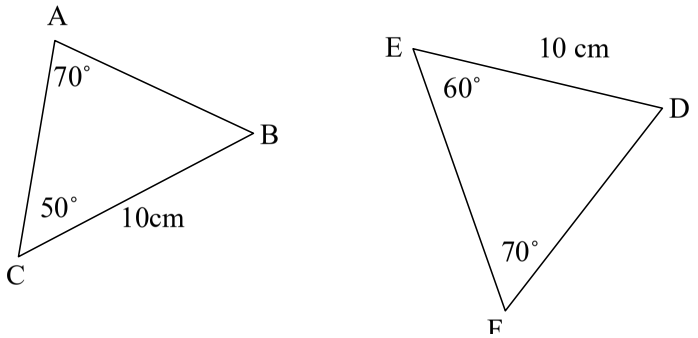
* means "may be challenging for some"

1. Which triangles are congruent? Give reasons.



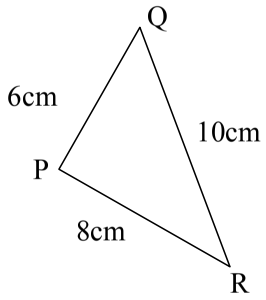
2. Prove that the triangles ABC and DEF are congruent.

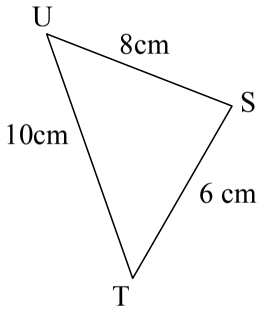
Diagrams not drawn to scale



3. Prove that the triangles PQR and STU are congruent.

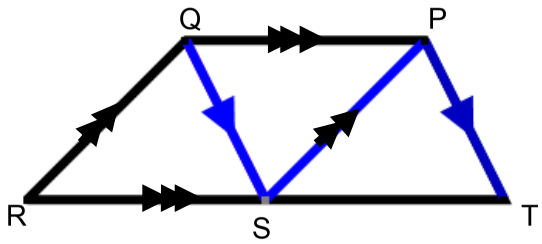
Diagrams not drawn to scale





4. PQRS is a parallelogram. The line drawn from P parallel to QS meets RS produced at T.
   Prove that TS = SR.

Diagram not drawn to scale



5. The triangle PQR is an isosceles triangle. PS is perpendicular to QR.
   (a) Use congruent triangles to prove that SQ = SR.
   (b) If PQ = 10cm and QR = 12cm, work out the area of the triangle PQR.

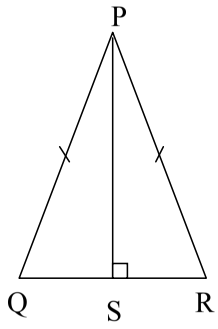


Diagram not drawn to scale

6. PQRS is a rectangle.
M is the mid-point of PQ, N is the midpoint of QR,
T is the midpoint of PS and U is the midpoint of RS.

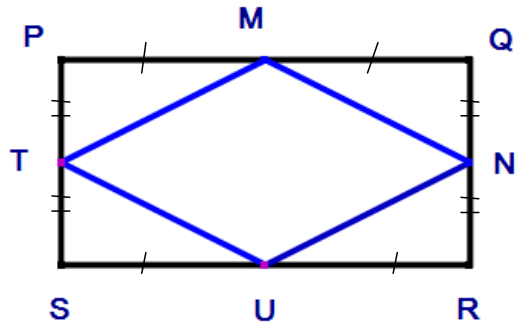


Diagram not drawn to scale

(a) Prove that the triangles PMT and RUN are congruent.
(b) Are the lines TM and UN equal? Why?
(c) Is the triangle STU congruent to the triangle RNU? Give reasons
(d) Are the lines TU and UN equal? Why?
(e) What is the special name given to the quadrilateral MNUT?
(f) If PQ = 8cm and PT = 6cm, what is the area of the quadrilateral MNUT?

7. ABCD is a kite, with AB = AD and BC = CD.
(a) Prove that triangles ABC and ADC are congruent.
The line joining B to D meets the diagonal AC at E.
(b) Prove that triangles ABE and ADE are congruent.
(c) Make a geometrical statement about the point E.
(d) If BD = 6cm and AC = 12cm, work out the area of the kite ABCD.

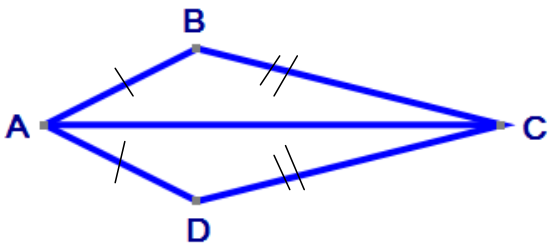
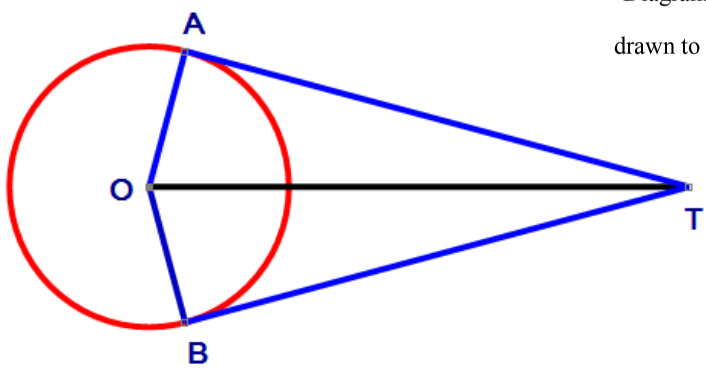


Diagram not drawn to scale

*8. TA and TB are tangents to the circle, centre, O.

(a) Use congruent triangles to prove that AT = BT.
(b) Which angle is equal to angle AOT?
(c) If angle AOT = 40°, work out the size of angle OTB.
(d) If the radius of the circle is 6cm and OT = 10cm, work out the area of the quadrilateral BOAT.

Diagram not drawn to scale

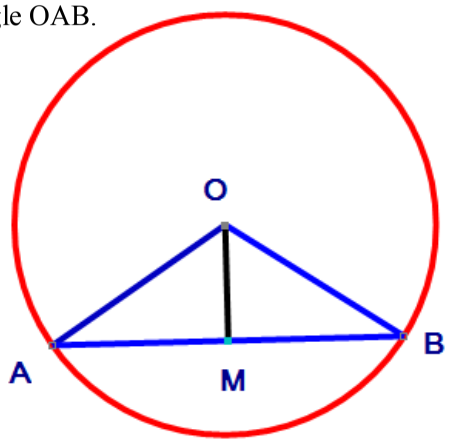


*9. The diagram below shows a circle, centre, O.

AB is a chord of the circle. M is the midpoint of AB.
(a) Use congruent triangles to prove that angle OMA is 90°.

*(b) If the radius of the circle is 13cm and AB = 24cm, work out the area of triangle OAB.

Diagram not drawn to scale



10. PQRS is a rectangle. T and V are the midpoints of PS and QR respectively.

U and W are points on PQ and RS such that PU = SW.

(a) Prove that triangles PUT and SWT are congruent.
(b) Why is UQ = WR?
(c) Hence, or otherwise, prove that triangles QUV and RWV are congruent.
(d) Hence, or otherwise, prove that triangles TUV and TWV are congruent.
(e) What is the special name given to the quadrilateral TUVW?
(f) If PQ = 12cm and QR = 6cm, what is the area of TUVW?
(g) If TV = 20cm and UW = 8cm, what is area of TUVW?

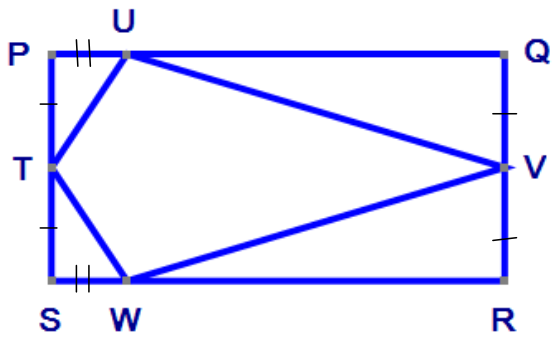
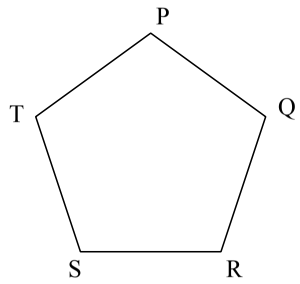


Diagram not drawn to scale

11. PQRST is a regular pentagon.

List all the triangles that are congruent to triangle RTQ.



12. PQRS is a square. M is the midpoint of PQ and N is the midpoint of PS.

(a) Use congruent triangles to prove that RM = QN.

* (b) Given that PQ = $2a$, where a is a positive integer,

use Pythagoras' Theorem to show that RM = $a\sqrt{5}$ = QN.

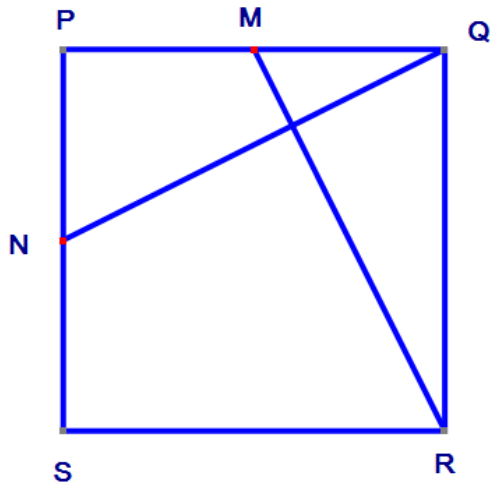


Diagram not drawn to scale

13. PQRS and PTUV are squares attached to the two sides of a triangle.
Prove that: (a) the triangle PQT and PSV are congruent.

** (b) QT is perpendicular to SV (that they meet at 90°).

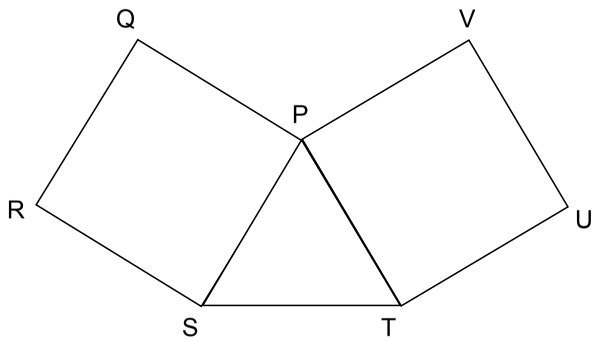


Diagram not drawn to scale

constructions and congruence in triangles

three sides the same [SSS].
(1) 9 cm, 8 cm and 5 cm.
(2) 11 cm, 6 cm and 4.5 cm.
Will everyone's triangles look the same?
Reasons?

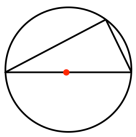
three angles the same [AAA].
(3) 45^o, 70^o, 65^o.
(4) 80^o, 40^o, 70^o.
Will all the triangles that people have drawn be identical (be congruent)?
Reasons?

two angles and an included side (between them) the same [ASA]
(5) 60^o, 9cm, 40^o.
(6) 100^o, 8cm, 30^o.
Will all the triangles drawn be congruent?
Reasons?

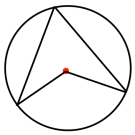
two sides and an angle [SAS] and [ASS]
a triangle PQR with:
(7) PQ = 9cm, QR = 8cm, angle P = 50^o.
(8) PQ = 9cm, PR = 11cm, angle P = 50^o.
(9) PQ = 8cm, PR = 6cm, angle R = 90^o.
(10) PQ = 10cm, PR = 7cm, angle P = 50^o.
Will all the triangles drawn be congruent?
Reasons?

3 Circle Theorem Proofs

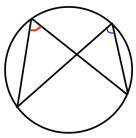
Question 1: Prove that the angle in a semi-circle is always 90°



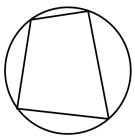
Question 2: Prove that the angle at the centre is twice the angle at the circumference.



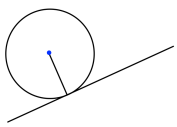
Question 3: Prove the angles in the same segment are equal.



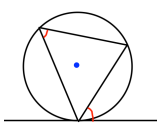
Question 4: Prove the opposite angles in a cyclic quadrilateral add to 180°



Question 5: Prove the angle between a tangent and the radius is 90°



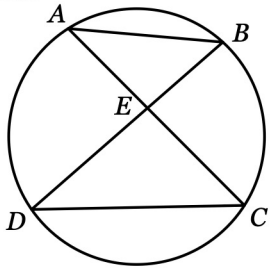
Question 6: Prove the alternate segment theorem; that the angle between the tangent and the chord at the point of contact is equal to the angle in the alternate segment.



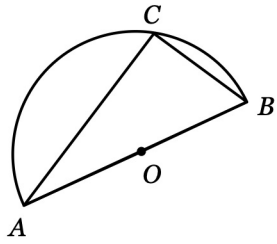
circle theorems and proof

Give reasons for each stage of your working.

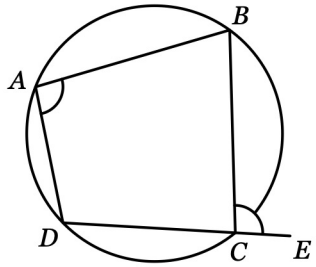
1. Prove that triangle AEB and triangle DEC are similar.



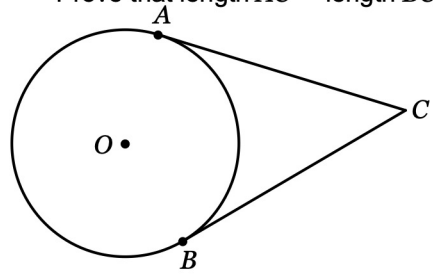
2. Point C lies on the arc of the semicircle. Prove that angle ACB is 90°.



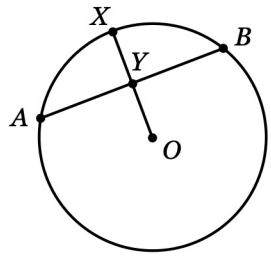
3. Prove that angle DAB is equal to angle BCE.



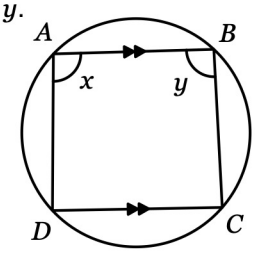
4. AC and BC are tangents to the circle. Prove that length AC = length BC.



5. OX is perpendicular to the chord AB. Prove that Y is the midpoint of AB.

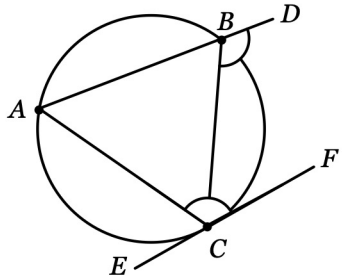


6. a) Prove that $x = y$.



b) Jake says that x and y could both measure 80°. Is he right?

7. Prove that angle CBD = angle ACF.



8. Prove that $y = x + 90$.