Basic Geometry Test Non Calculator

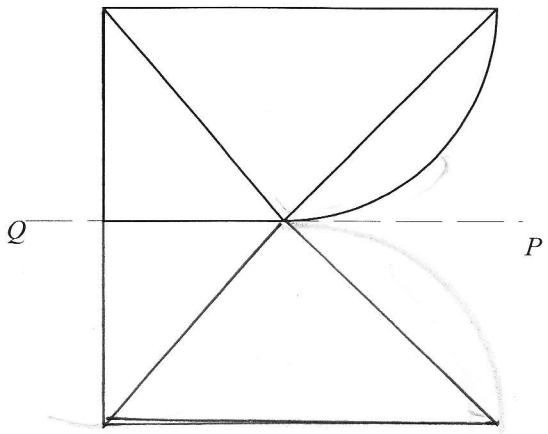
Year 9

Short Answer Section

Name : _____

Write all working and answers in the spaces provided on this test paper.

1. Complete the figure below so that it has an axis of symmetry along the line PQ.
Use a ruler for all straight lines.



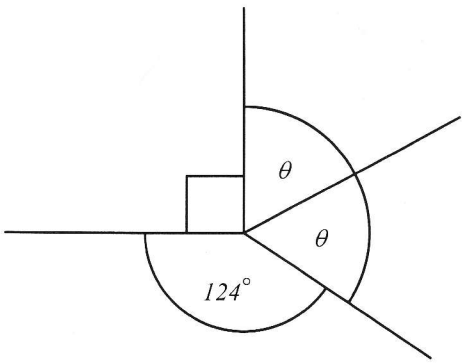
2. Find the value of θ .

$2\theta + 90 + 124 = 360°$

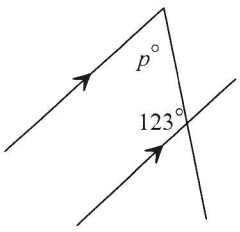
$2\theta = 360° - 214°$

$= 146°$

$\theta = \frac{146}{2} = 73°$



3. Find the value of p.

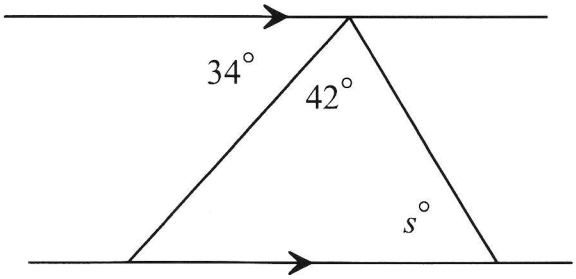


$p + 123 = 180°$

$p = 180 - 123°$

$= 57°$

4. Find the value of s in the diagram.

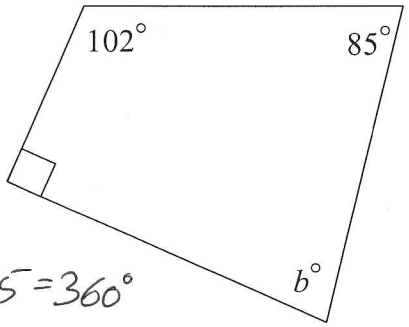


Not to Scale

$s + 42 + 34 = 180°$

$s = 180 - 76 = 104°$

5. What is the value of b?

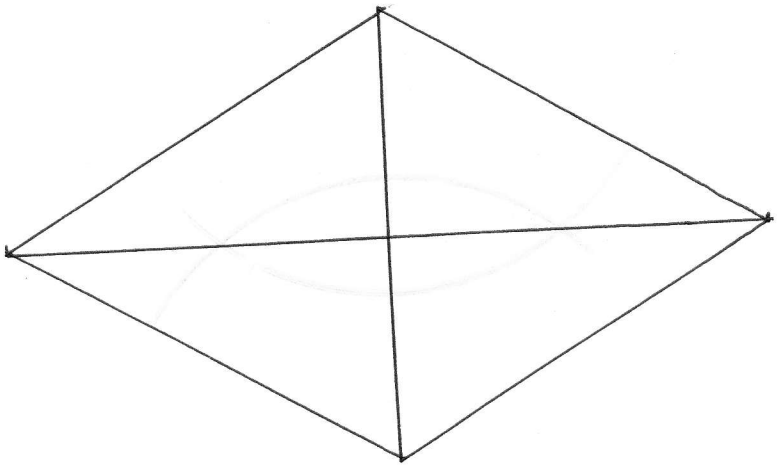


$b + 90 + 102 + 85 = 360°$

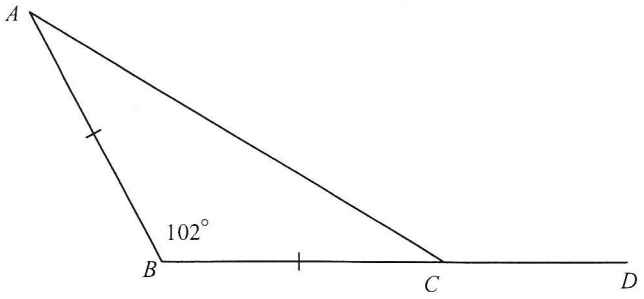
$b = 360° - 277°$

$b = 83°$

6. Use a ruler to draw a rhombus which has diagonals which are 10 cm and 6 cm in length.



7. In the figure below, $AB = BC$. Find the size of the obtuse angle ACD below.



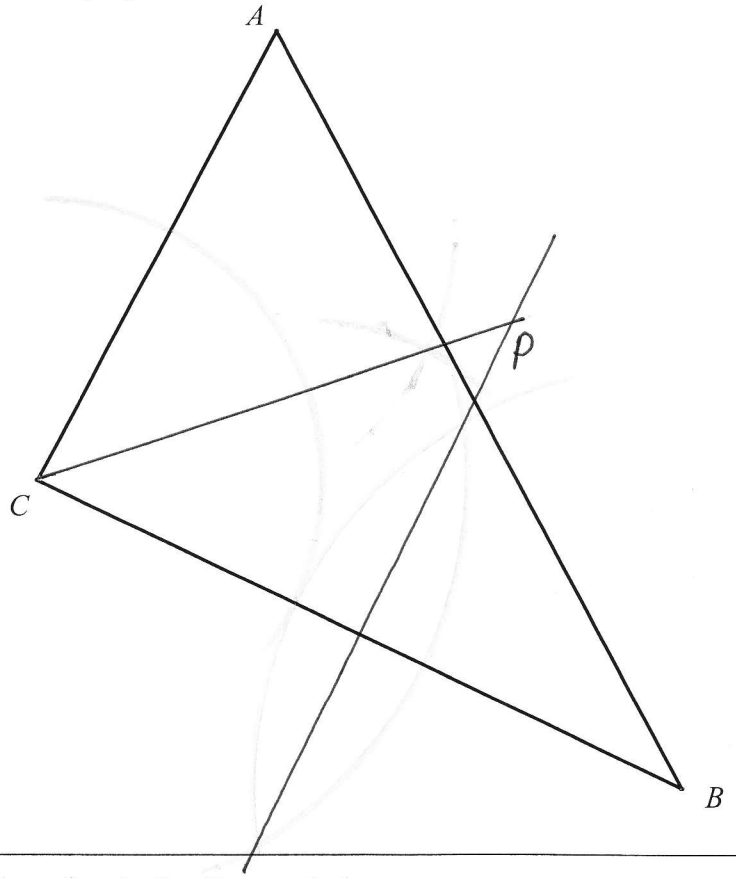
$\angle BCA = (180 - 102) \div 2 = 39°$

$\angle ACD = 180° - 39° = 141°$

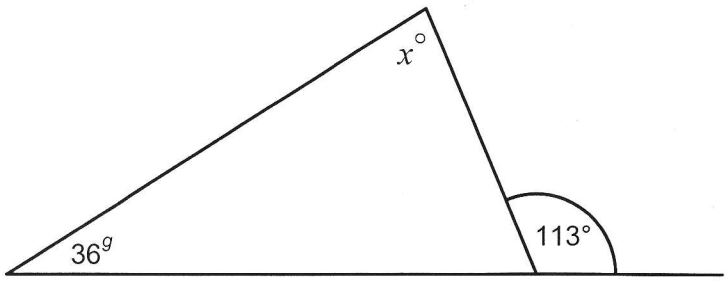
8. Use a pair of compasses and a rule to locate point P.

P lies on the line which bisects $\angle ACB$.

P lies on the perpendicular bisector of BC.



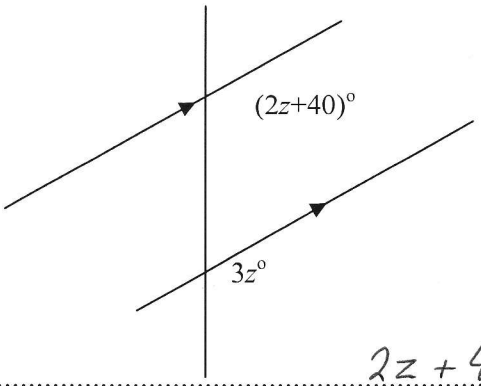
9. Find the value of x in the diagram below.



$x + 36 = 113°$ (exterior angle)

$x = 113 - 36 = 77°$

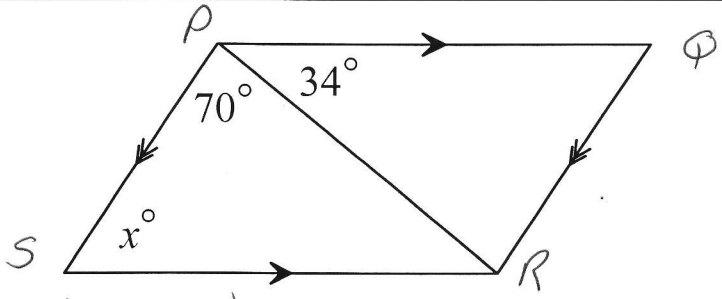
10. What is the value of z in the diagram?



$2z + 40 = 3z$ (corresponding angles)

$z = 40°$

11. Find the value of x.



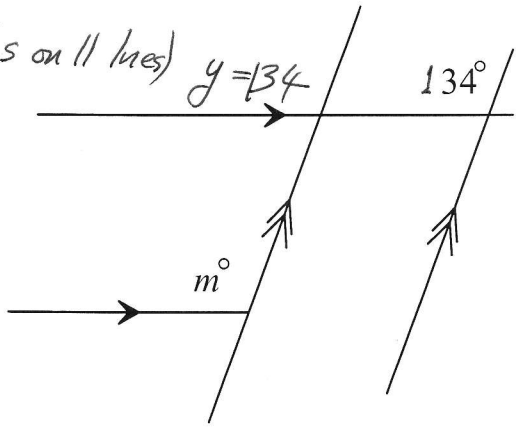
$\angle PRS = 34°$ (alternate angles)

$x = 180 - (70 + 34)$ (angle sum Δ) $x = 76°$

12. Find the value of m.

$y = 134°$ (corresp $\angle$s on // lines)

$m = 134°$ (corresp $\angle$s)



Basic Geometry Test

Year 9

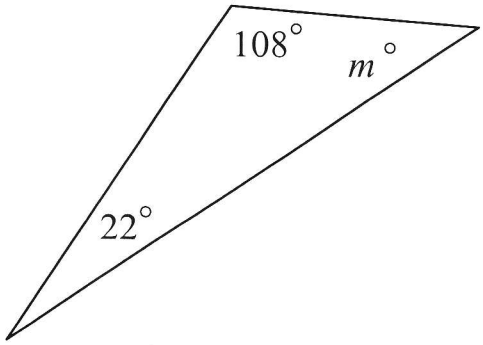
Calculator

Multiple Choice Section

Name : _____

Mark all your answers on the accompanying multiple choice answer sheet, not on this test paper. You may do any working out on this test paper. Calculators are allowed for this section.

1. The value of m is:



A. 50°

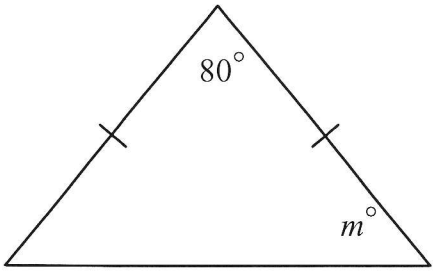
B. 86°

C. 108°

D. 130°

---

2. Find the value of m in the triangle.



A. $m = 80^\circ$

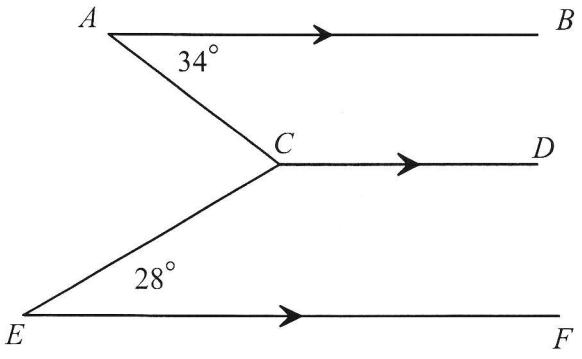
B. $m = 100^\circ$

C. $m = 50^\circ$

D. $m = 40^\circ$

---

3. The intervals AB, CD and EF are parallel.
$\angle BAC = 34^\circ$ and $\angle CEF = 28^\circ$.
What is the size of $\angle ACE$?



A. 118°

B. 84°

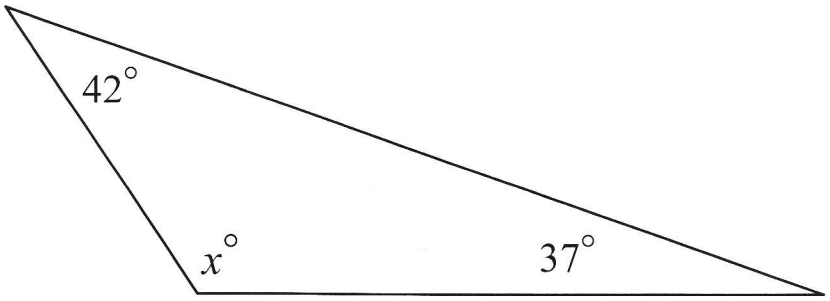
C. 96°

D. 62°

---

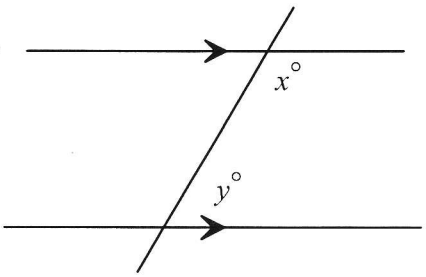
4. Find the value of x in the triangle below.

A. 79°
B. 101°
C. 42°
D. 37°

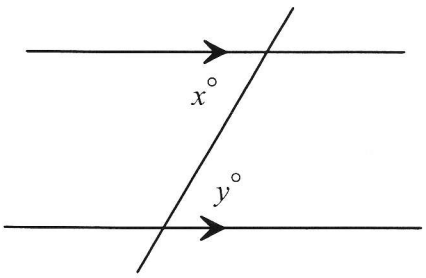


5. In which diagram is $x = y$?

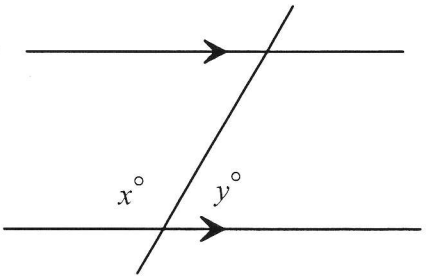
A.



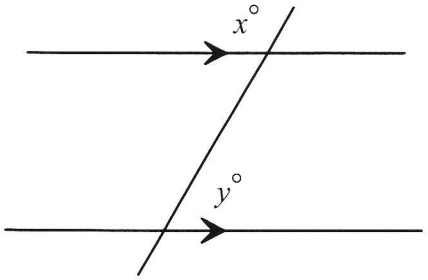
B.



C.

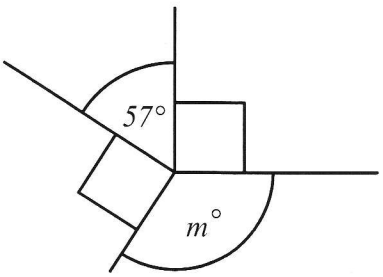


D.



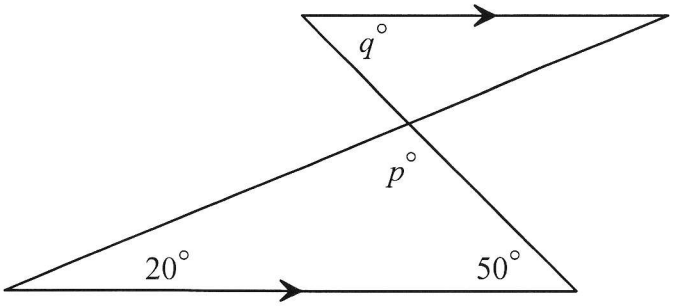
6. What is the value of m?

A. 57°
B. 33°
C. 123°
D. 213°



7. What are the values of p and q?

A. $p = 110$ and $q = 20$
B. $p = 70$ and $q = 50$
C. $p = 110$ and $q = 50$
D. $p = 70$ and $q = 130$



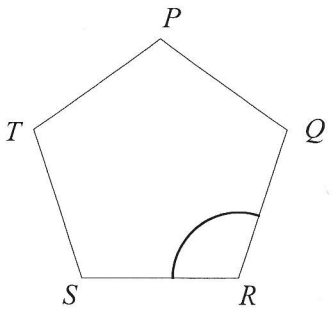
8. A quadrilateral has a pair of equal diagonals that bisect one another at an angle of 100°. The quadrilateral is a:

A. rhombus. B. parallelogram

C. square D. rectangle

9. Figure $PQRST$ is a regular pentagon.

What is the size of $\angle QRS$?



A. 108° B. 36°

C. 72° D. 144°

Year 10

Enlargement and Similarity Test

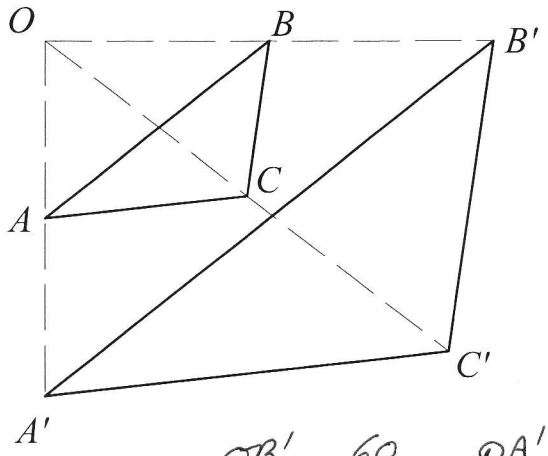
Non Calculator

Short Answer Section

Name : _____

Write all working and answers in the spaces provided on this test paper.

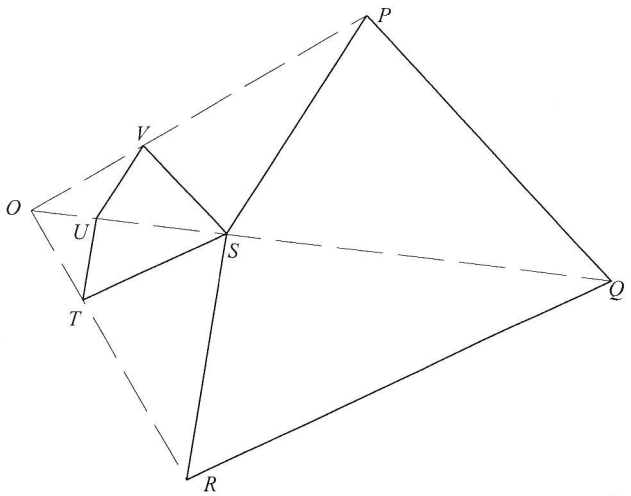
1. What is the scale factor when ΔABC is enlarged to $\Delta A'B'C'$?



$\frac{OB'}{OB} = \frac{60}{30}$ $\frac{OA'}{OA} = \frac{46}{23}$ $\frac{OC'}{OC} = \frac{66}{33} = 2$

Scale factor = 2

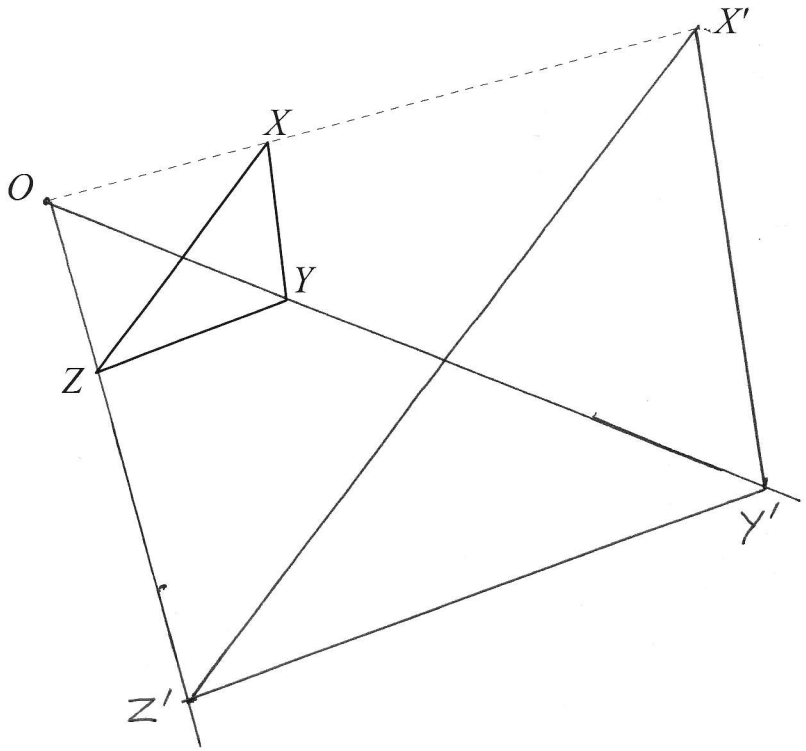
2. What is the scale factor when $PQRS$ is reduced to $VSTU$?



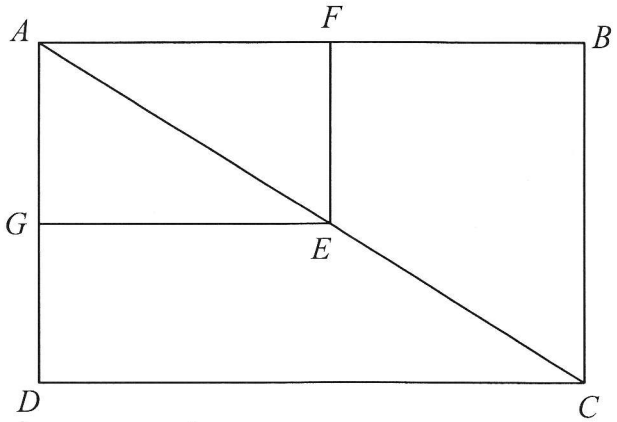
$\frac{OV}{OP} = \frac{17}{51}$ $\frac{OU}{OS} = \frac{9}{27}$ $\frac{OS}{OQ} = \frac{26}{78}$ $\frac{OT}{OR} = \frac{14}{42}$

Scale factor = $\frac{1}{3}$

3. ΔXYZ is enlarged to $\Delta X'Y'Z'$ with a scale factor 3. The point O is the centre of the enlargement. Complete the enlargement.



4. $ABCD$ is a rectangle and E is a point on the diagonal AC. $AFEG$ is a rectangle drawn through A and E. Name two triangles which are similar to triangle ABC.



.....ΔAFE and ΔAEG.....

.....

5. Complete the statement :

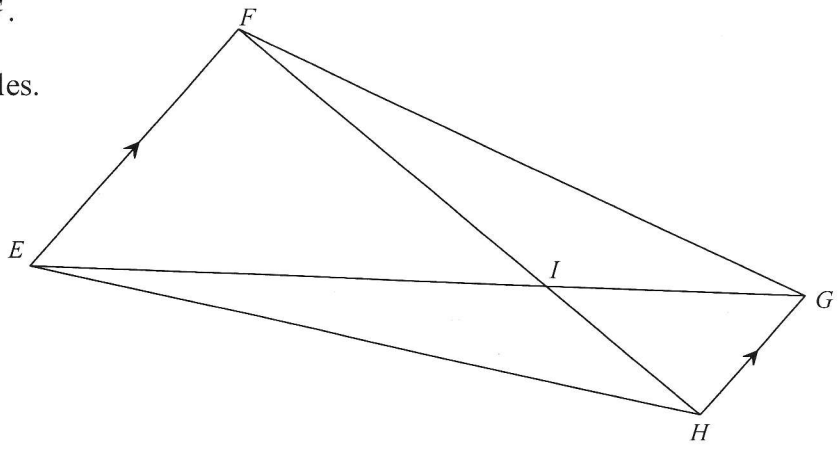
When two figures are similar the corresponding sides of the two figures are.....

.....in the same ratio. in proportion.....

.....

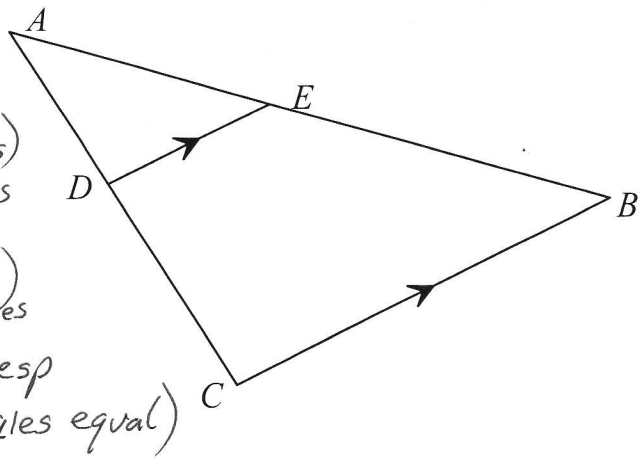
6. In the figure shown $EF \parallel HG$.

Name a pair of similar triangles.



$\Delta EFI \;|||\; \Delta GHI$

7. In the diagram, $CB \parallel DE$.
Explain why $\Delta ABC \;|||\; \Delta AED$.



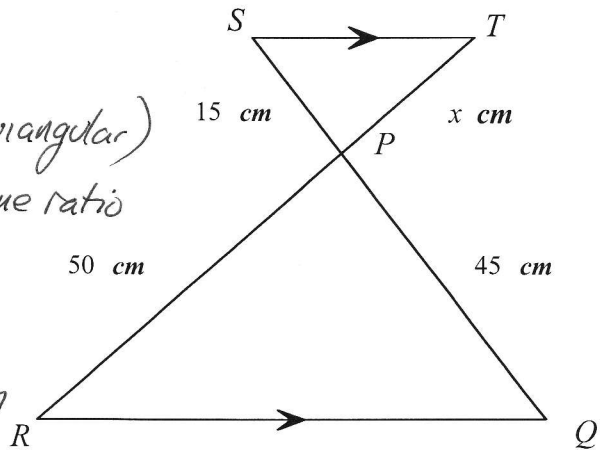
$\angle ADE = \angle ACB$ (corresponding $\angle$s on $\parallel$ lines)

$\angle A$ is common.

$\angle AED = \angle ABC$ (corresp $\angle$s on $\parallel$ lines)

$\therefore \Delta ABC \;|||\; \Delta AED$ (corresp angles equal)

8. In the diagram, $ST \parallel RQ$.
Find the value of x.



$\Delta STP \;|||\; \Delta QRP$ (equiangular)

$\therefore$ corresp sides in same ratio

$\frac{x}{50} = \frac{15}{45}$

$x = \frac{15}{45} \times 50 = 16\frac{2}{3}$ cm

Enlargement and Similarity Test

Year 9

Calculator

Multiple Choice Section

Name : _____

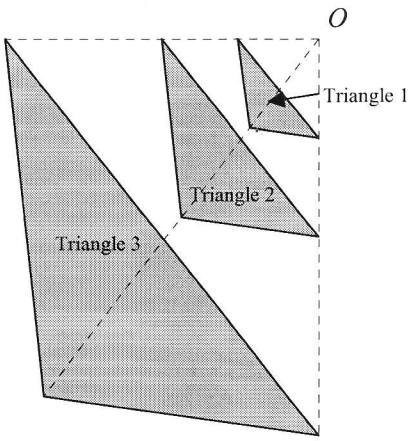
Mark all your answers on the accompanying multiple choice answer sheet, not on this test paper. You may do any working out on this test paper. Calculators are allowed for this section.

1. The scale on a drawing of an ant is 200 : 1. If the length of the ant on the drawing is 48 cm, what is the actual length of the ant?

   A. 1.2 mm B. 0.24mm C. 2.4 mm D. 24mm

---

2. Which transformations could have been used to produce the diagram shown?



   A. Triangle 1 is enlarged with factors $k = 2$ and $k = \frac{1}{2}$

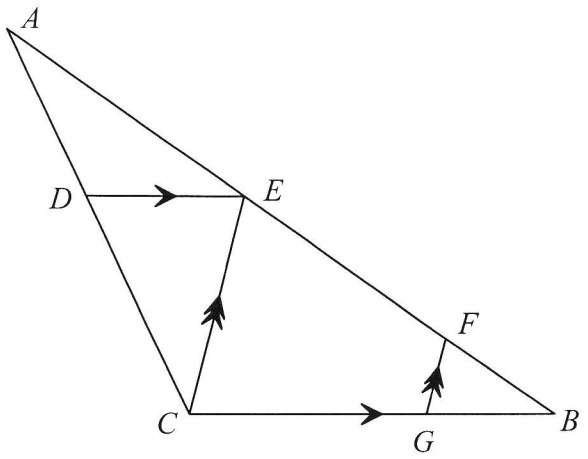
   B. Triangle 2 is enlarged with factors $k = 2$ and $k = \frac{1}{2}$

   C. Triangle 3 is enlarged with factors $k = 1$ and $k = \frac{1}{2}$

   D. Triangle 2 is enlarged with factors $k = \frac{1}{2}$ and $k = \frac{1}{4}$

---

3. Which triangles are similar in the diagram below?



   A. $\Delta AED \,|||\, \Delta CED$

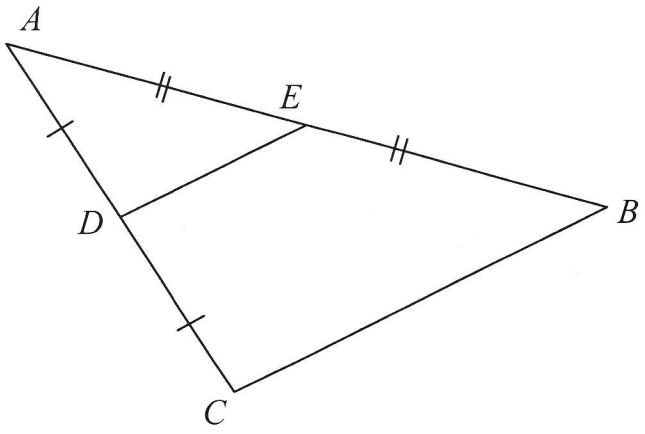
   B. $\Delta AED \,|||\, \Delta FGB$

   C. $\Delta AED \,|||\, \Delta ABC$

   D. $\Delta AED \,|||\, \Delta BEC$

---

4. Which reason could be used to prove that $\Delta AED \,|||\, \Delta ABC$?



A. *The three corresponding sides of the triangles are proportional.*

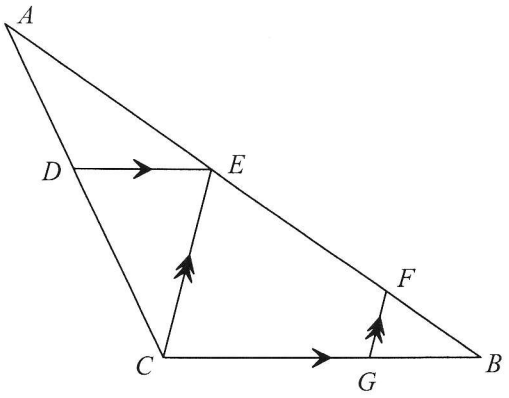
B. *The three corresponding angles of the triangles are proportional.*

C. *The three corresponding angles of the triangles are equal.*

D. *Two corresponding sides of the triangles are proportional and the included angle is common.*

---

5. Which statement is correct?



A. $\Delta FBG \,|||\, \Delta EBC$

B. $\Delta FBG \,|||\, \Delta ABC$

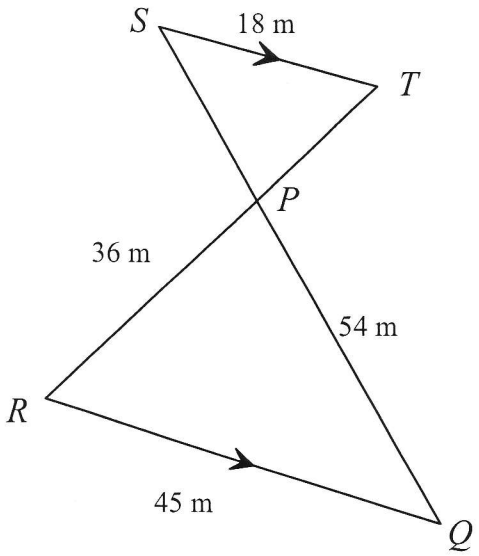
C. $\Delta FBG \,|||\, \Delta ECD$

D. $\Delta FBG \,|||\, \Delta AEC$

---

6. In the diagram, $ST \,||\, RQ$,
ST = 18 m, RP = 36 m,
RQ = 45 m and PQ = 54 m.

What is the length of PT?



A. 14.4 m

B. 21.6 m

C. 15.0 m

D. 27 m

---

7. A photocopier is used to enlarge a diagram with a scale factor of 1.5. The area of the original diagram was 60 cm^2. What is the area of the enlarged diagram?

A. 60 cm^2.

B. 90 cm^2.

C. 135 cm^2.

D. 202.5 cm^2.

---

8. A folk doll is made in similar sizes. A smaller doll is 15cm high and has a volume of 900 cm^3. If a larger doll is 25 cm high, what is its volume?

A. 1 500 cm^3.

B. 2 500 cm^3.

C. 4 166 cm^3.

D. 5 400 cm^3.

Enlargement and Similarity Test

Year 9

Calculator

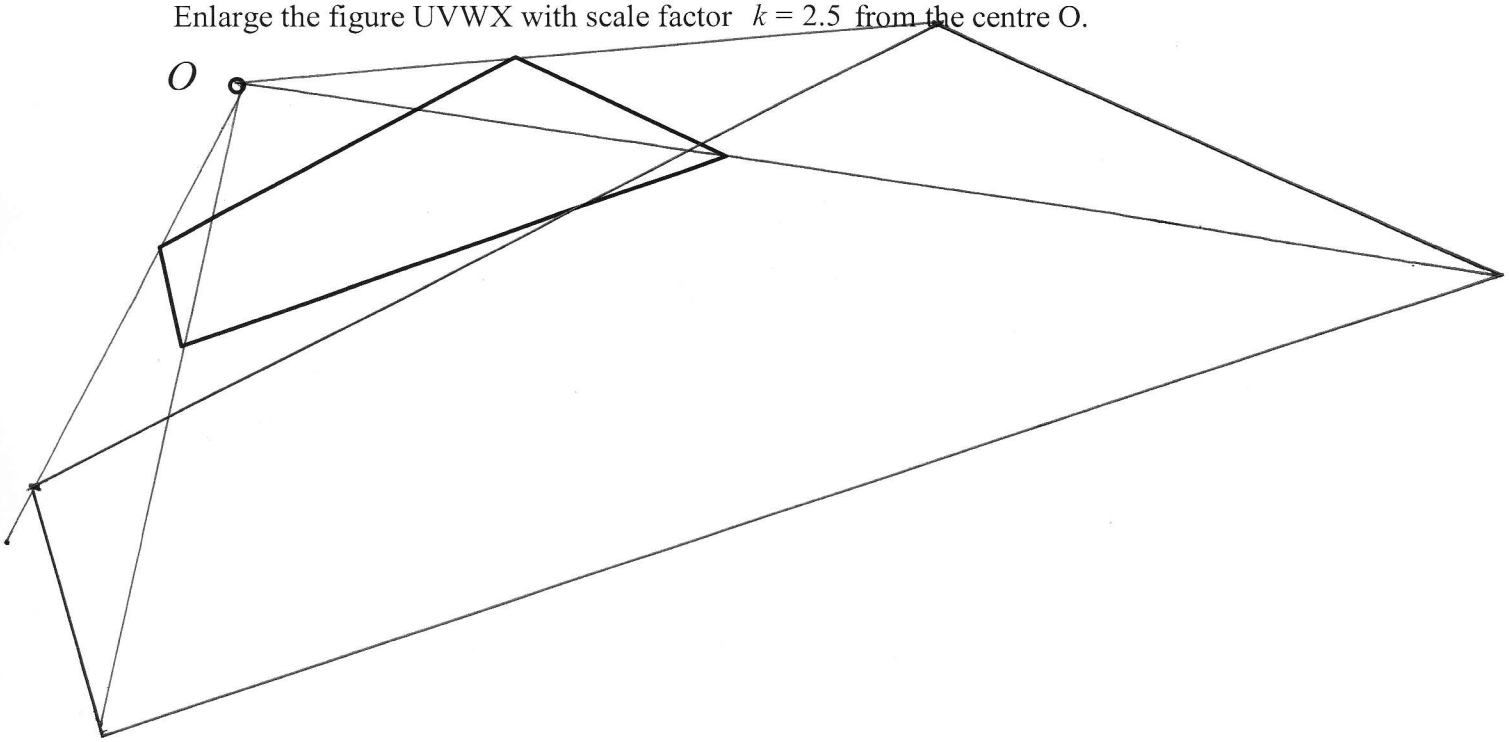
Longer Questions

Name : _____

Write all working and answers in the spaces provided on this test paper.
Calculators are allowed for this section.

(a) (2 marks)

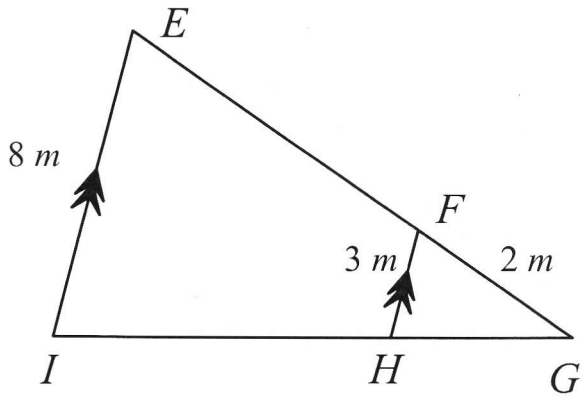
Enlarge the figure UVWX with scale factor $k = 2.5$ from the centre O.



1. (b) (2 marks)

In the diagram $EI \parallel FH$.

Prove that $\Delta EGI \,|||\, \Delta FGH$.



In ΔEGI and ΔFGH

$\angle G$ is common

$\angle IEG = \angle HFG$ (corresp $\angle$s, lines)

$\angle EIG = \angle FHG$ " "

$\therefore \Delta EGI \,|||\, \Delta FGH$ (corresp angles equal)

(b) (2 marks)

$EI = 8\ m$, $FH = 3\ m$ and $FG = 2\ m$.

Calculate the length of EF.

$\frac{EI}{FH} = \frac{EG}{FG}$ $\quad \frac{8}{3} = \frac{EG}{2}$

$EG = \frac{8}{3} \times 2 = \frac{16}{3} = 5\frac{1}{3}$

$EF = EG - FG$

$= 5\frac{1}{3} - 2 = 3\frac{1}{3}$

Year 10

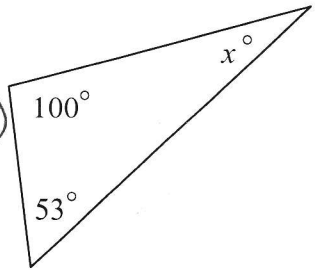
Geometric Reasoning Test — Non Calculator

Short Answer Section

Name : _____

Write all working and answers in the spaces provided on this test paper.
All questions are worth 2 marks.

1. Find the value of x, giving reasons.

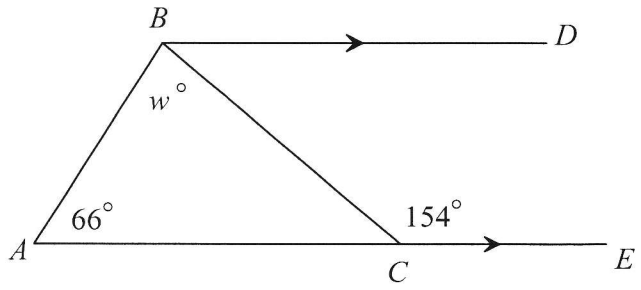


$x = 180 - (100 + 53)$ (angle sum Δ)

$= 180 - 153$

$= 27°$

2. Find the value of w, giving reasons.



$\angle CBD = 180° - 154$ (cointerior $\angle$s $\parallel$ alltrect $\angle$'s lines)

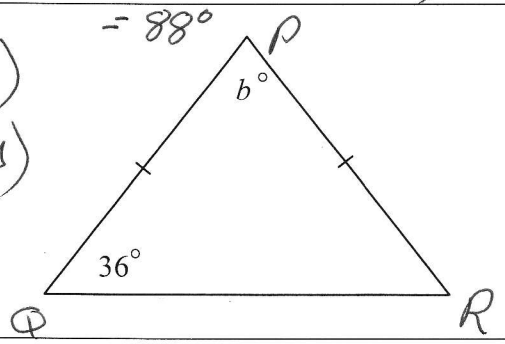
$= 26°$

$\angle BCA = 26°$ (alternate $\angle$s on $\parallel$ lines)

$\angle ABC = 180° - (66 + 26)$ angle sum Δ

$= 88°$

3. Find the value of b, giving reasons.

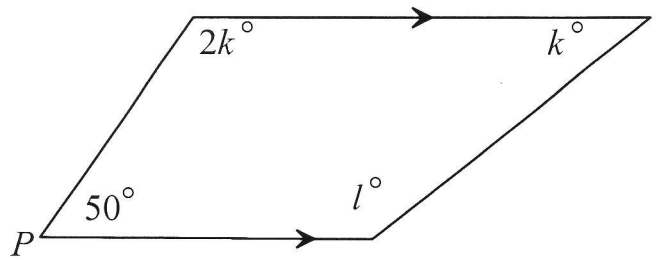


$\angle PRQ = \angle PQR = 36°$ (isos. Δ)

$b = 180 - 2 \times 36$ (angle sum Δ)

$= 108°$

4. Find the values of k and l, giving reasons.



$2k + 50 = 180°$ (cointerior $\angle$s)

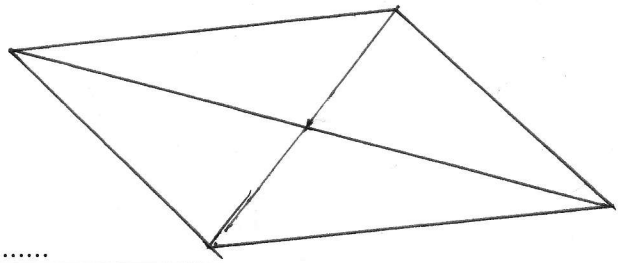
$2k = 130 \quad k = 65$

$L = 180 - 65$ (cointerior $\angle$s)

$= 115°$

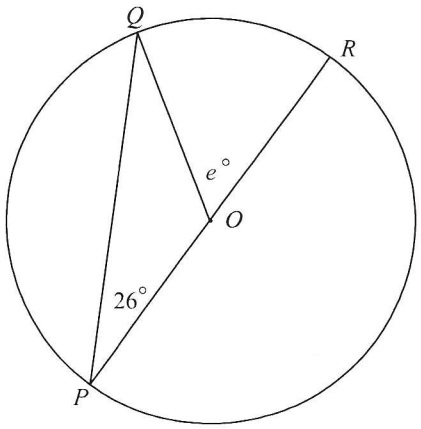
5. Draw a sketch of, and name the quadrilateral which has the following properties.

- Opposite sides are equal.
- Opposite sides are parallel.
- Diagonals bisect at an angle of 70°.



Name .....

6. O is the centre of the circle.
Find the value of e, giving reasons.



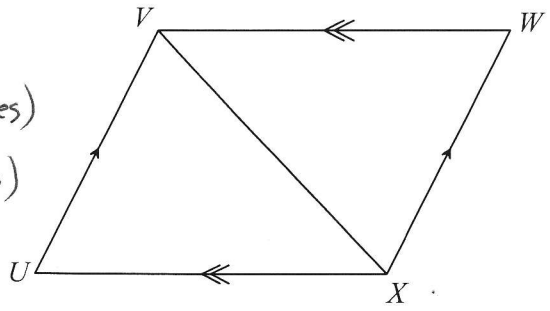
OQ = OP (radii of circle)

∠OQP = ∠OPQ = 26° (isos Δ)

∠QOR = 2×26° (exterior ∠ of Δ)

e = 52°

7. $UVWX$ is a parallelogram.
Explain with reasons why $\Delta UVX \equiv \Delta WXV$.



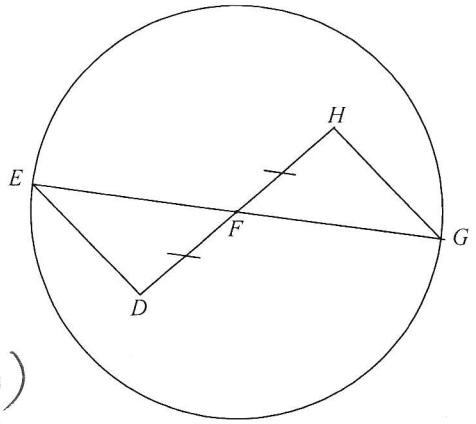
∠UVX = ∠VXW (alt ∠s // lines)

∠UXV = ∠XVW (alt ∠s // lines)

VX is common.

∴ ΔUVX ≡ ΔWXV (AAS)

8. $DF = HF$
F is the centre of the circle.
Explain with reasons why $\Delta EFD \equiv \Delta GFH$.



EF = FG (radii)

FD = FH (given)

∠EFD = ∠GFH (vert opp ∠s)

∴ ΔEFD ≡ ΔGFH (SAS)

Geometric Reasoning Test

Year 10

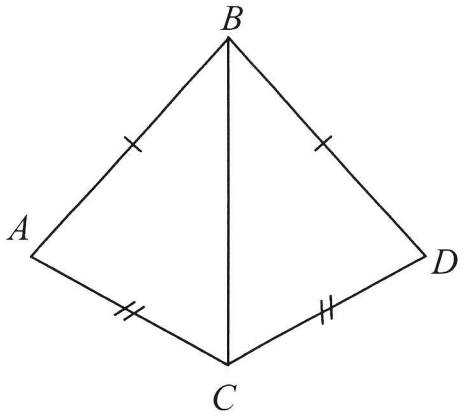
Calculator

Multiple Choice Section

Name : _____

Mark all your answers on the accompanying multiple choice answer sheet, not on this test paper. You may do any working out on this test paper. Calculators are allowed for this section.

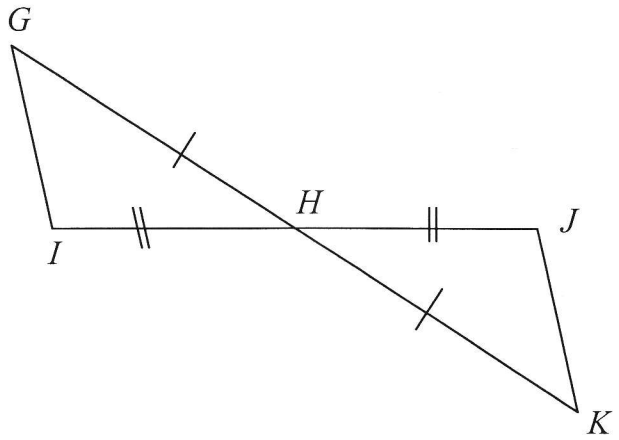
1. Which of the congruence tests is sufficient to prove that $\Delta ABC \equiv \Delta DBC$?



A. Three corresponding sides are equal. (SSS)
B. Two corresponding sides and an included angle are equal. (SAS)
C. Two angles and a corresponding side are equal. (AAS)
D. A right triangle, the hypotenuse and a corresponding side are equal. (RHS)

---

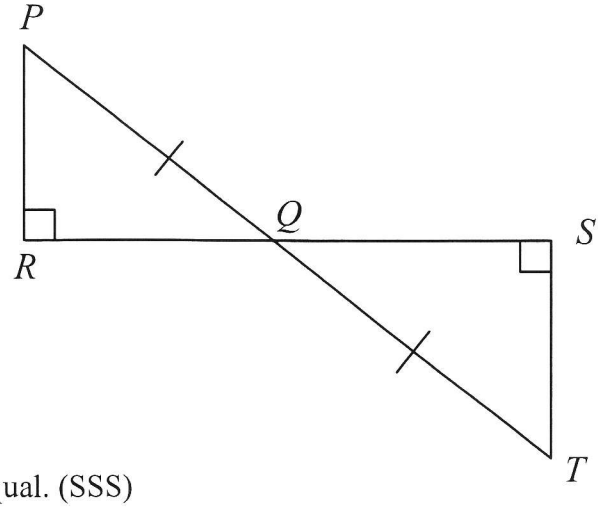
2. Which of the congruence tests is sufficient to prove that $\Delta GHI \equiv \Delta KHJ$?



A. Three corresponding sides are equal. (SSS)
B. Two corresponding sides and an included angle are equal. (SAS)
C. Two angles and a corresponding side are equal. (AAS)
D. A right triangle, the hypotenuse and a corresponding side are equal. (RHS)

---

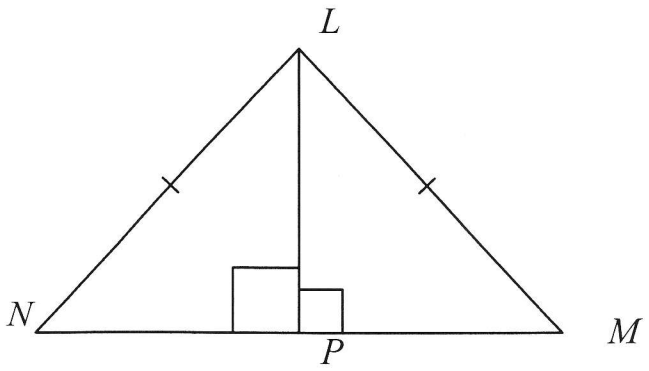
3. Which of the congruence tests is sufficient to prove that $\Delta PQR \equiv \Delta TQS$?



A. Three corresponding sides are equal. (SSS)
B. Two corresponding sides and an included angle are equal. (SAS)
C. Two angles and a corresponding side are equal. (AAS)
D. A right triangle, the hypotenuse and a corresponding side are equal. (RHS)

---

4. Which of the congruence tests is sufficient to prove that $\Delta LPN \equiv \Delta LPM$?



A. Three corresponding sides are equal. (SSS)
B. Two corresponding sides and an included angle are equal. (SAS)
C. Two angles and a corresponding side are equal. (AAS)
D. A right triangle, the hypotenuse and a corresponding side are equal. (RHS)

---

5. Which of these statements is **always** true:

A. The sum of two acute angles is an acute angle.
B. The sum of two acute angles is an obtuse angle.
C. The sum of an acute angle and an obtuse angle is an obtuse angle.
D. The sum of two obtuse angles is a reflex angle.

---

6. Which of the following is **not** a property of a right isosceles triangle:

A. It has one pair of equal angles.
B. It has an angle sum of 180°.
C. It has all sides equal.
D. It has no obtuse angles.

---

7. A quadrilateral *ABCD* has the following properties:
The diagonals are not equal.
The diagonals bisect one another.
The opposite angles are equal.

Which of these names could be used for *ABCD*?

A. Square.
B. Rectangle.
C. Parallelogram.
D. Kite.

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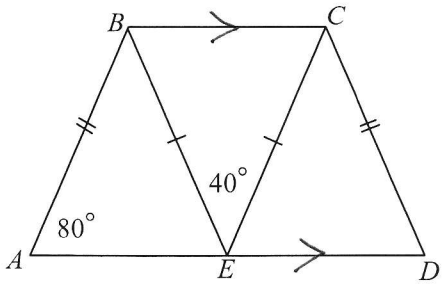
8. What is the size of angle ABE?



A. 30^{o}
B. 70^{o}
C. 80^{o}
D. 110^{o}

Geometric Reasoning Test

Year 9

Calculator

Longer Questions

Name : _____

Write all working and answers in the spaces provided on this test paper.
Calculators are allowed for this section.

1. (a) Find the size of $\angle QTR$ giving reasons for each step.

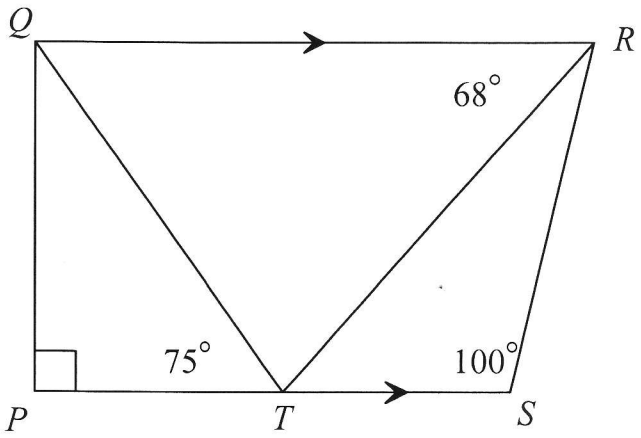
3 marks

$\angle TQR = 75°$ (alt $\angle$s, lines)

$\angle QTR = 180° - (75+68)$

(angle sum Δ)

$\angle QTR = 37°$



(b) Find the value of y, giving reasons for each step.

3 marks

$\angle C = 75°$ (isos Δ)

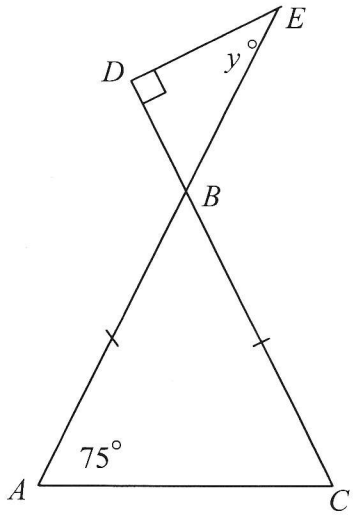
$\angle ABC = 180 - (2 \times 75°)$

$= 30°$ (angle sum Δ)

$\angle DBE = 30°$ (vert opp $\angle$s)

$\angle DEB = 180° - (90+30)$

$= 60°$ (angle sum Δ)



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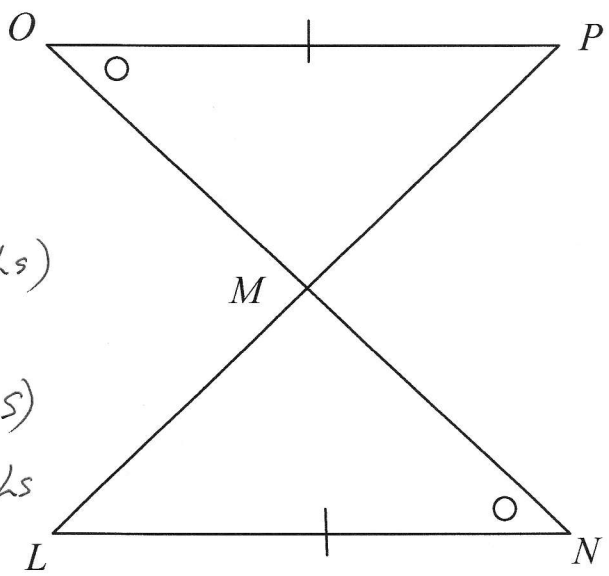
2. a)

3 marks

Given $OP = NL$ and $\angle O = \angle N$ prove that $\Delta OPM \equiv \Delta NLM$ and hence that $OM = NM$ giving reasons for each step.



$\angle O = \angle N$ (given)

$\angle OMP = \angle LMN$ (vert opp $\angle$s)

$OP = LN$ (given)

$\therefore \Delta OPM \equiv \Delta NLM$ (AAS)

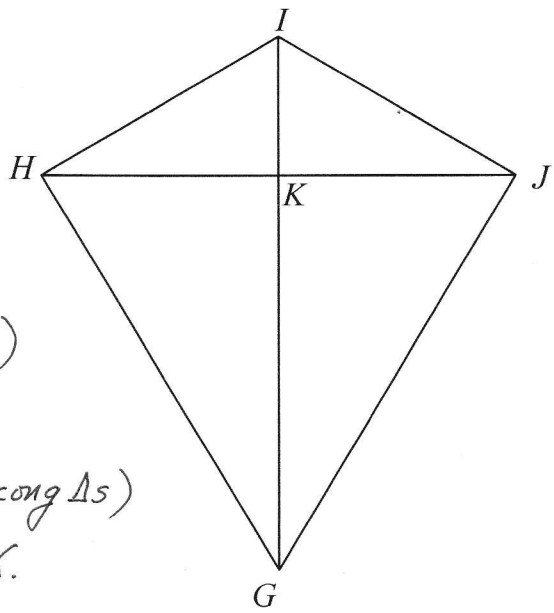
$\therefore LP = LL$ (corresp $\angle$s in cong Δs)

---

b)

3 marks

$GHIJ$ is a kite with $\angle HKG = 90^\circ$. Prove that $\Delta GHK \equiv \Delta GJK$ and hence that IG bisects HJ, giving reasons for each step.



$HG = GJ$ (equal sides kite)

KG is common

$\angle HKG = \angle KGJ = 90^\circ$ (given)

$\therefore \Delta HKG \equiv \Delta JKG$ (RHS)

$\therefore HK = KJ$ (corresp sides cong Δs)

$\therefore IG$ bisects HJ at K.
