Carlingford High School

Mathematics
Year 9 5.2 Term 3 Exam
2019

Name: _____

Please circle your class:

9MA2_1 (Miss Aung) 9MA2_X (Mrs Lobejko) 9MA2_Y (Mr Gong)
9MA2_4 (Mrs Virmani/Mr Fardouly)

Time allowed: 50 minutes

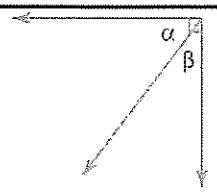
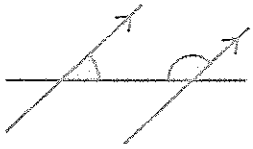
- Show all necessary working
- Answer all questions in the spaces provided
- Marks may be deducted for careless or untidy work
- Complete the examination in blue or black pen

Topic	Geometry	Congruent and Similar Figures	Trigonometry	Mark	
Mark	/22	/28	/20	/70	%

Geometry (22 marks)

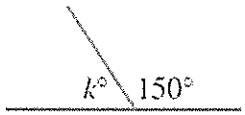
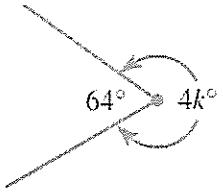
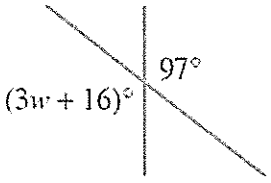
Question 1. For each of the following diagrams, write the matching reason from the Geometry Reference sheet.

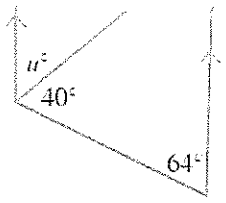
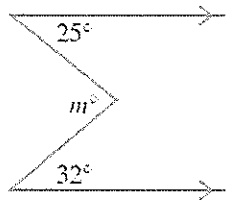
[3 marks]

	Question	Reason
(a)		
(b)		
(c)		

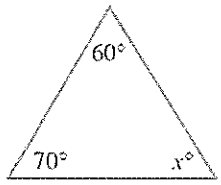
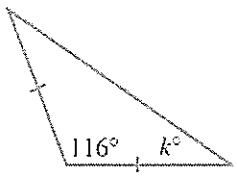
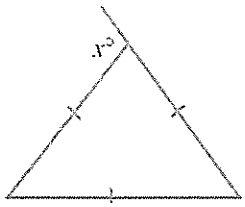
Question 2. Find the value of each pronumeral. (**Working is required for two mark questions**)

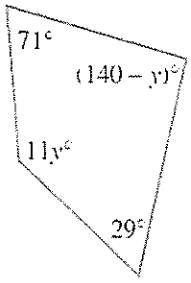
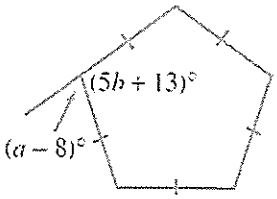
[9 marks]

	Question	Working and Answer
(a)		
(b)	 [2 marks]	
(c)	 [2 marks]	

(d)	 [2 marks]	
(e)	 [2 marks]	

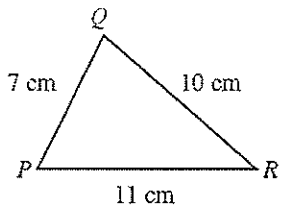
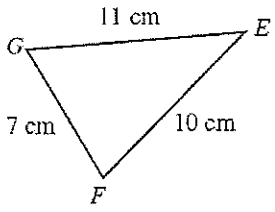
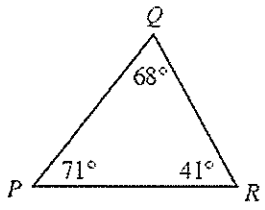
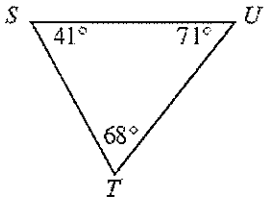
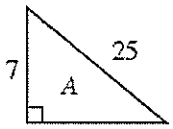
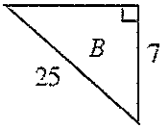
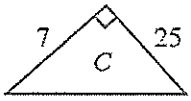
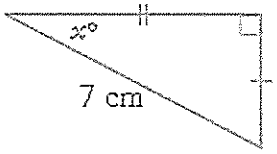
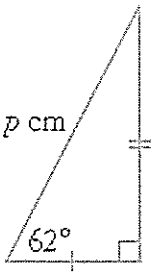
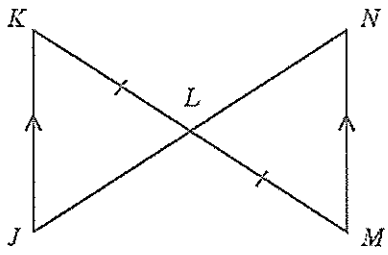
Question 3. Find the value of each pronumeral. [10 marks]

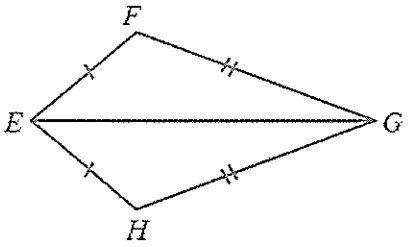
	Question	Working, answer and reasons
(a)	 [2 marks]	Reason:
(b)	 [2 marks]	Reason:
(c)	 [2 marks]	Reason:

(d)	 [2 marks]	Reason:
(e)	 (no reasons required) [2 marks]	The interior angle of a regular pentagon is 108°. Find the value of a and b.

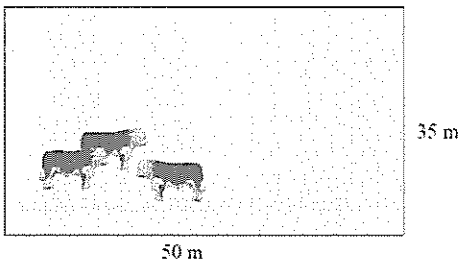
Congruent and Similar Figures (28 marks)

Question 4. [13 marks]

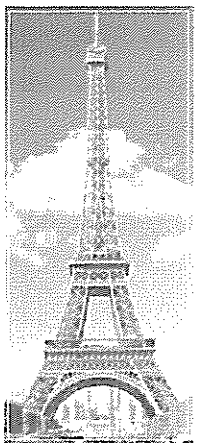
	Question	Answer
(a)	 	Complete this congruence statement. (Use the correct order) $\Delta PQR \equiv \Delta$_____
(b)	 	Explain why these triangles are **not** congruent. _____ _____ _____ _____
(c)	   [2 marks]	(i) Which pair of triangles are congruent? _____ and _____ (ii) State the congruence test. (____ ____ ____)
(d)	  [3 marks]	(i) State the congruence test. (____ ____ ____) (ii) $p =$ _____ (iii) $x =$ _____
(e)	 [3 marks]	Complete the congruence proof. In ΔJKL and ΔNML $KL = ML$ $\angle JKL = \angle$_____ $\angle KLJ = \angle MLN$ (Reason: _____ _____) $\therefore \Delta JKL \equiv \Delta NML$ (____ ____ ____)

(f)	 [3 marks]	This pair of triangles pass the *SSS* congruence test. (i) Hence, give a reason why $\angle EFG = \angle EHG$. _____ _____ (ii) Complete the sentence: This proves that a _____ has one pair of _____ angles equal.

Question 5. [15 marks]

	Question	Answer
(a)	 [3 marks]	The measurements of a rectangular cattle yard are given in the diagram. (Not drawn to scale) (i) Make a scale drawing of the yard using a scale of 1: 1000. (ii) What would be the **area** of the scale drawing if a scale of 1: 750 is used instead? _____ _____ _____

(b)



[2 marks]

The Eiffel Tower in France is 324m high, with a square base measuring 125m on each side.

A scale model of the tower is 30cm tall.

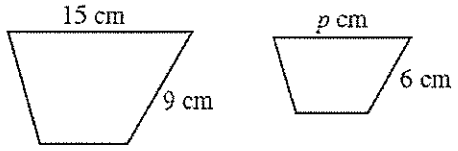
Calculate the length of each of the scale model's base sides. (Write your answers in centimetres, correct to 1 decimal place)

_____

_____

_____

(c)



[3 marks]

These figures are similar.

(i) Scale factor = _____

(ii) Find the value of p.

_____

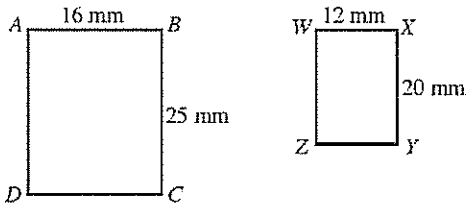
_____

(ii) Reason: _____

_____

_____

(d)



[2 marks]

Show all calculations to prove that these rectangles are **not** similar.

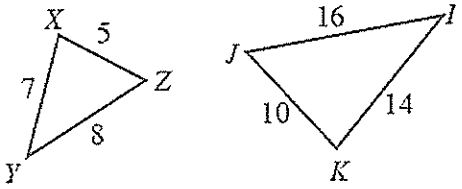
_____

_____

_____

_____

(e)



[2 marks]

(i) Write the test that proves that these triangles are similar.

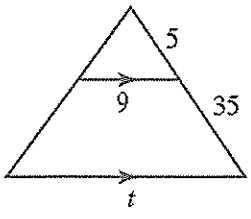
_____

_____

_____

(ii) Complete: ΔXYZ _____ Δ_____

(f)



(i) Write the test that proves that these triangles are similar.

_____

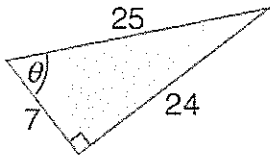
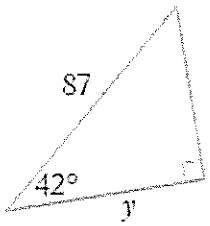
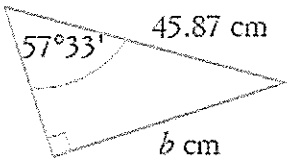
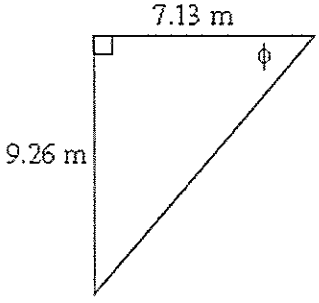
_____

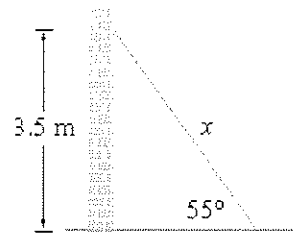
_____

	[3 marks]	_____ (ii) Find the value of t. _____ _____ _____ _____

Trigonometry (20 marks)

Question 6. [20 marks]

	Question	Answer
(a)	Evaluate each expression, correct to 4 decimal places (where appropriate). [3 marks]	(i) $25cos12^\circ =$ _____ (ii) $\frac{9.2}{sin30^\circ} =$ _____ (iii) $tan20^\circ35' =$ _____
(b)	Round each angle, correct to the nearest minute. [2 marks	(i) $68^\circ14'35''$ _____ (ii) 25.5372° _____
(c)	 [4 marks]	(i) How long is the side **adjacent** to θ? _____ (ii) Write $tan\theta$ as a fraction. _____ (iii) Find the value of θ, correct to the nearest degree. _____ _____
(d)	 [2 marks]	Calculate the value of y, correct to the nearest whole number. _____ _____ _____
(e)	 [2 marks]	Calculate the value of b, correct to one decimal place. _____ _____ _____
(f)	 [2 marks]	Find the value of $\emptyset$, correct to the nearest minute. _____ _____ _____ _____

(g)	 [2 marks]	A ladder leaning against a vertical wall reaches 3.5m up the wall and makes an angle of 55° with the ground. Complete the working to find the length of the ladder, correct to 1 decimal place. $sin55^\circ = \frac{3.5}{x}$ $x =$ _____
(h)	In ΔABC, $\angle A = 42^\circ$, $\angle B = 90^\circ$ and $AB = 10m$. [3 marks]	(i) **Draw and label** this triangle. (You do **not** need to use a protractor) (ii) Find the length of *AC*, correct to the nearest centimetre.

END OF TEST!

Geometry Reference Sheet

- Adjacent angles
- Alternate angles on parallel lines
- Angle in an equilateral triangle
- Angles in a right-angle
- Angles at a point
- Angles in a straight-angle
- Angle sum of a triangle
- Angle sum of an isosceles triangle
- Angle sum of a quadrilateral
- Co-interior angles on parallel lines
- Corresponding angles on parallel lines
- Exterior angle of a triangle
- Exterior angle of a regular polygon
- Matching sides equal (SSS)
- Matching sides in equal ratio
- Matching angles of congruent triangles
- Matching sides of congruent triangles
- Matching sides in similar triangles in equal ratio
- Matching angles in similar triangles equal
- The hypotenuses and shorter sides of right-angled triangles are equal (RHS)
- Two pairs of matching sides and the included angles are equal (SAS)
- Two pairs of angles and a matching side are equal (AAS)
- Two pairs of matching sides in equal ratio, and included angles equal
- Two pairs of matching angles equal
- Vertically opposite angles