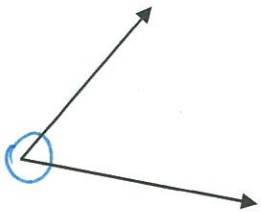
GEOMETRY (58 marks)

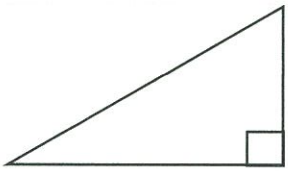
Q.1 Circle the vertex of the following angle.



(1)

Q.2 Use the word bank on the sheet attached to classify each of the following triangles by both angles and sides.

(i)

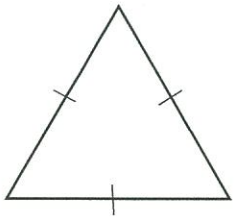


By angle: Right angled

By sides: Scalene

2

(ii)

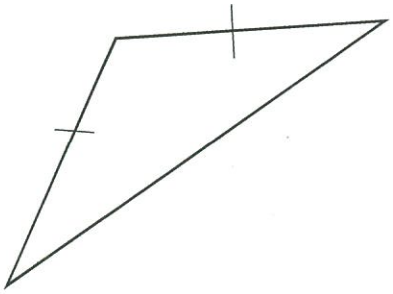


By angle: acute

By sides: equilateral

2

(iii)



By angle: obtuse

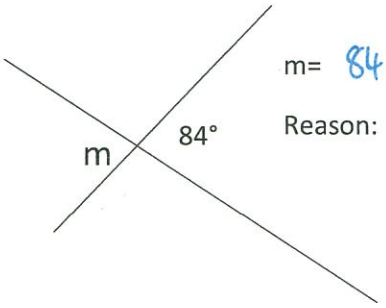
By sides: Isosceles

2

(6)

Q.3 Find the value of each pronumeral, giving reasons (use the word bank)

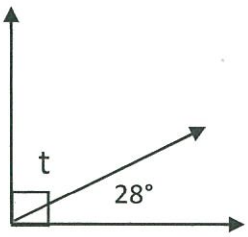
(i)



m= 84

Reason: vert. opp.

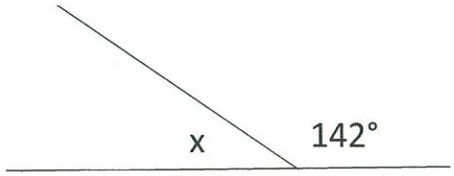
(ii)



t= 62°

Reason: adj compl.

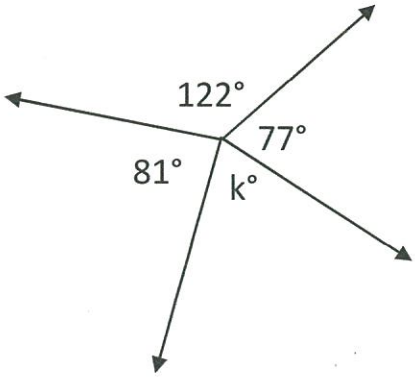
(iii)



x= 38°

Reason: Supplementary

(iv)



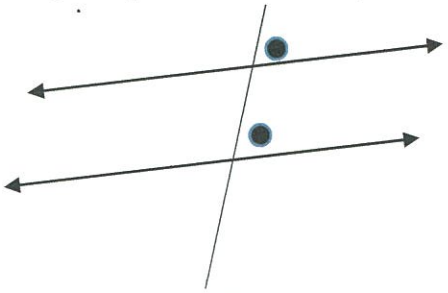
k= 80°

Reason: angles at a point.

(8)

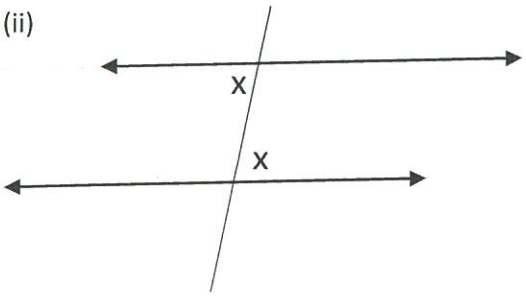
Q.4 State what type of angles are marked in each diagram. (use the word bank)

(i)



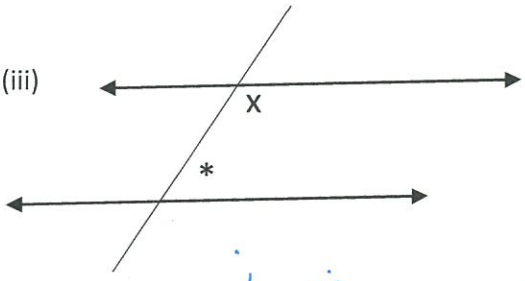
corresponding

(ii)



alternate

(iii)

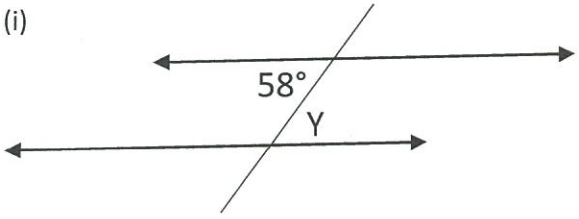


conteior

(3)

Q.5 Find the value of each pronumeral, giving reasons (see word bank).

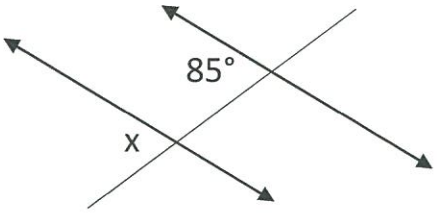
(i)



Y= 58°

Reason: alternate

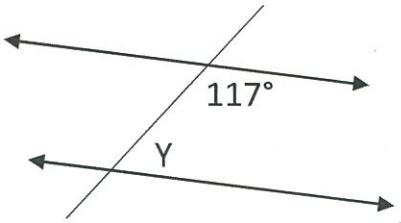
(ii)



X= 85°

Reason: corresponding

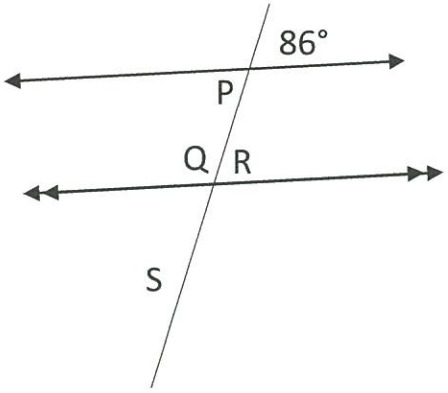
(iii)



Y= 63°

Reason: conteior

(iv)



P= 86°

Reason: vertically opposite

Q= 94°

Reason: conteior.

R= 86°

Reason: corresponding

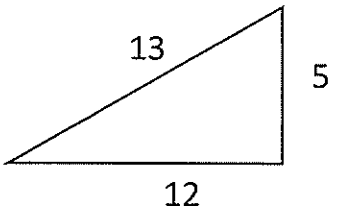
S= 86°

Reason: vert. opp.

(14)

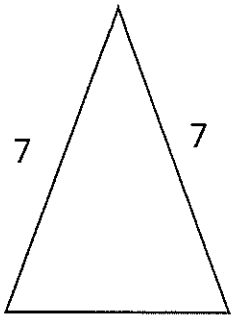
Q.6 Classify each triangle according to its sides (use the word bank).

(i)



Scalene

(ii)

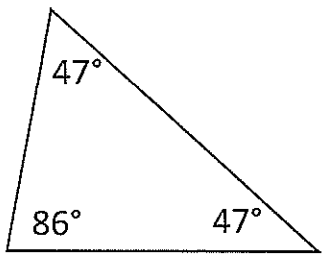


Isosceles

2

Q.7* Classify each triangle according to BOTH its **angles and sides** (use the word bank).

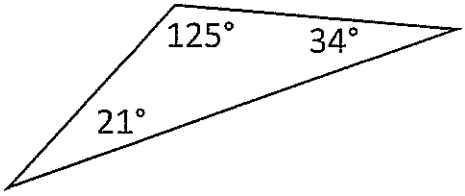
(i)



acute isosceles

2

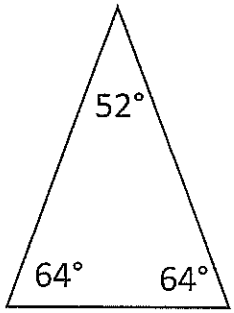
(ii)



obtuse scalene

2

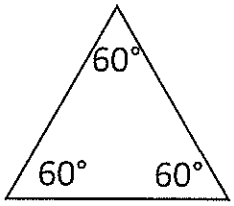
(iii)



acute isoseeles

2

(iv)

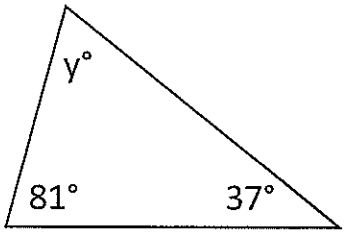


acute equilateral

2

Q.8 Find the value of the pronumeral in each of the following:

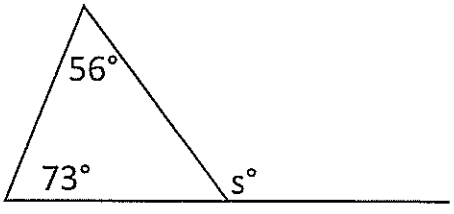
(i)



$y = 180 - 81 - 37 = 62$

1

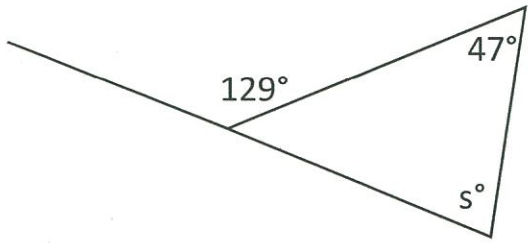
(ii)



$S = 56 + 73 = 129$

1

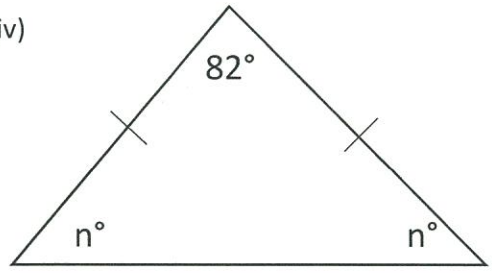
(iii)



$129 = 47 + s$ (1)

$s = 129 - 47 = 82$ (1)

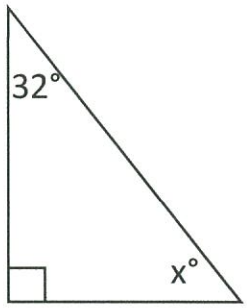
(iv)



(1)

$180 - 82 = 98$ $n = 49$

(v)



(1)

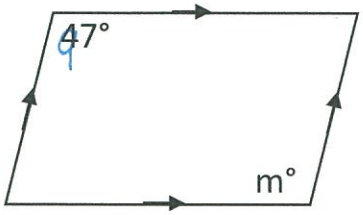
$x = 58°$

Q.9 What is the angle sum of a quadrilateral?

$360°$ (1)

Q.10 Find the value of the pronumeral in each of the following:

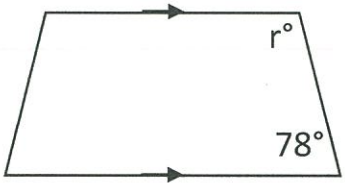
(i)



(1)

$m = 47$

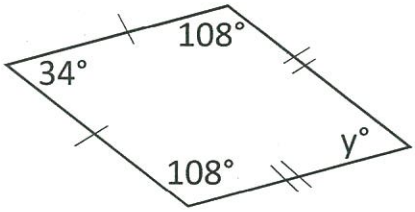
(ii)



(1)

$r = 102°$

(iii)



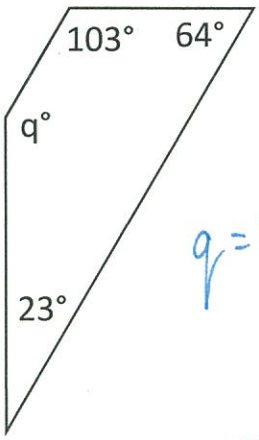
(1)

$y = 360 - 2 \times 108 - 34$

$= 360 - 216 - 34 = 360 - 250$

$y = 110$

(iv)



(1)

$q = 360 - 103 - 64 - 23$

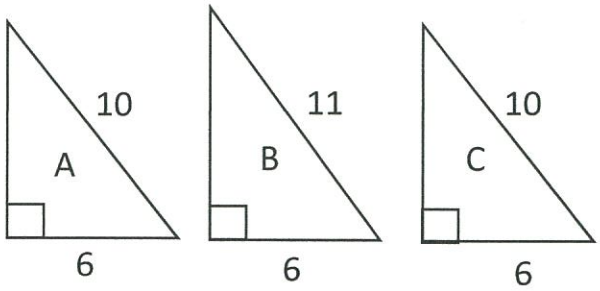
$= 360 - 190$

$= 170°$.

Q.11 Name the two triangles in each set which are congruent and state which reason you used

(use the word bank)

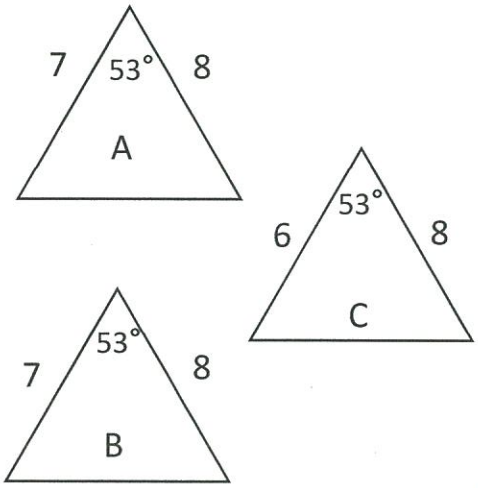
(i)



A and C (2)

Reason: RHS

(ii)

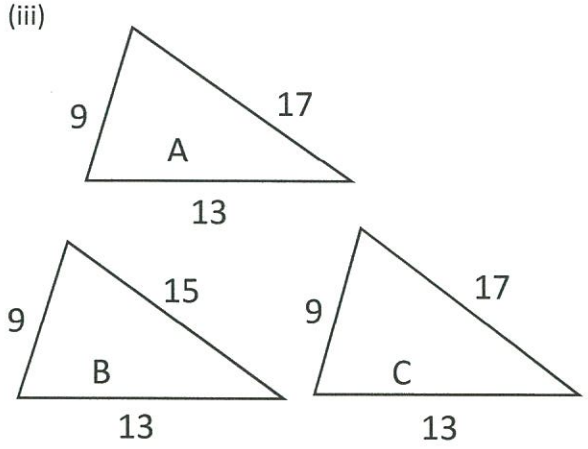


(2)

A and B

Reason: SAS

(iii)



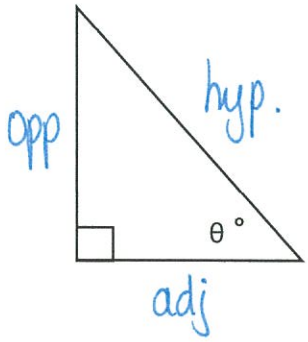
A and C (2)

Reason: SSS

47

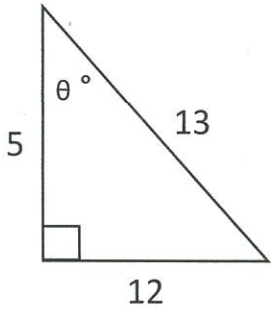
TRIGONOMETRY

Q.1 Label the hypotenuse, opposite and adjacent sides to the angle θ in the following triangle.



(2)

Q.2 In the following triangle



(2)

How long is the side which is

(i) opposite the angle θ? 12

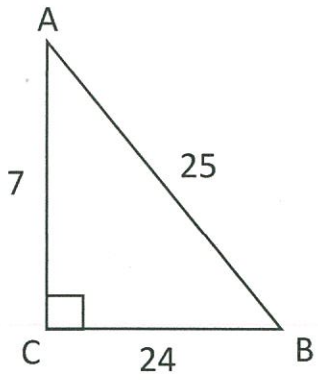
(ii) adjacent to θ? 5

(iii) the hypotenuse? 13

(1)

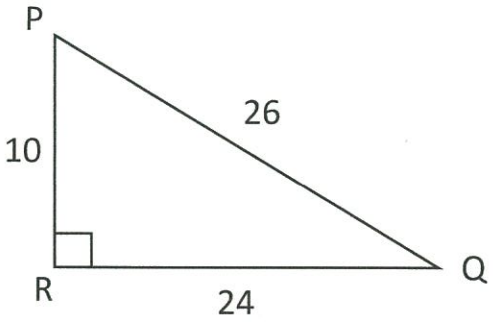
Q.3 How many minutes in 1 degree? 60'

Q.4 What is the ratio of tan B in the following triangle?



tan B = $\frac{7}{24}$ (1)

Q.5 Find each of the following ratios for the triangle given below.



(i) sin P = $\frac{24}{26}$

(ii) cos Q = $\frac{24}{26}$

(iii) tan P = $\frac{24}{10}$ (5)

(iv) sin Q = $\frac{10}{26}$

(v) tan Q = $\frac{10}{24}$

Q.6 Use your calculator to evaluate each of the following ratios and give your answer to three decimal places.

(i) sin 30° = 0.580

(ii) cos 45°= 0.707

(iii) tan 60°= 1.732

(iv) cos 23°= 0.921

(v) sin 74°= 0.961 (5)

Q.7 Find each of the following angles θ to the nearest degree.

(i) sin θ= 0.8290 56°

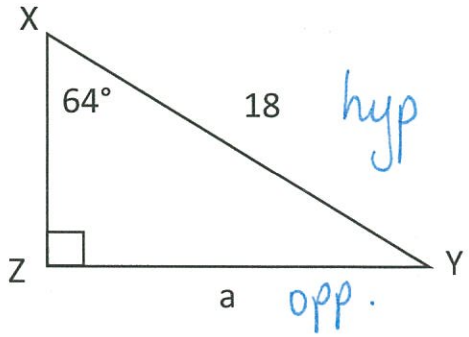
(ii) cos θ= 0.3090 72° (5)

(iii) tan θ= 0.3249 18°

(iv) cos θ = $\frac{6}{10}$ 53°

(v) tan θ = $\frac{12}{17}$ 35°

Q.8 For the following triangle,



(i) On the diagram label the side lengths given as either opposite, adjacent or hypotenuse in relation to the angles. 1

(ii) State which ratio should be used to find the pronumeral on the unknown side. 1

Sin

(iii) Put your values into the formula and use it to find the length of the unknown side to the nearest whole number.

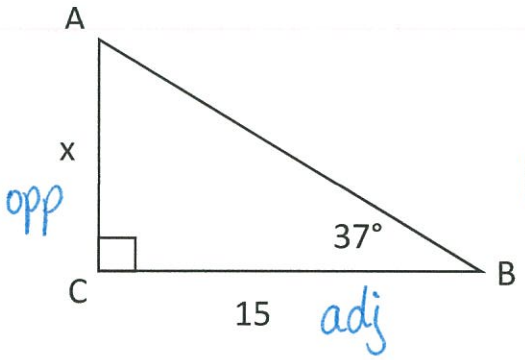
$\sin 64 = \frac{a}{18}$ 1

$a = 18 \sin 64$ 1

$= 16$

(4)

Q.9 For the following triangle,



1

(i) On the diagram, label the side lengths given as either opposite, adjacent or hypotenuse in relation to the angles.

(ii) State which ratio should be used to find the pronumeral on the unknown side.

tan 1

(iii) Put your values into the formula and use it to find the length of the unknown side to the nearest whole number.

$\tan 37 = \frac{opp}{adj} = \frac{x}{15}$ 1

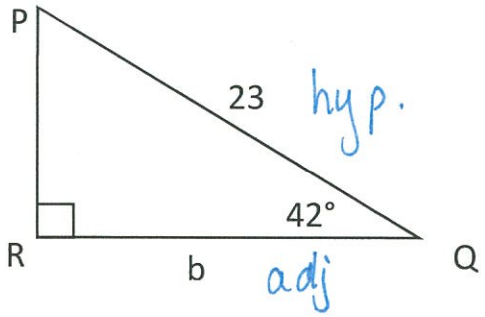
$x = 15 \tan 37°$ 1

$= 11.3$

≈ 11

(4)

Q.10 For the following triangle,



1

(i) On the diagram, label the side lengths given as either opposite, adjacent or hypotenuse in relation to the angles.

(ii) State which ratio should be used to find the pronumeral on the unknown side.

cos 1

(iii) Put your values into the formula and use it to find the length of the unknown side to the nearest whole number.

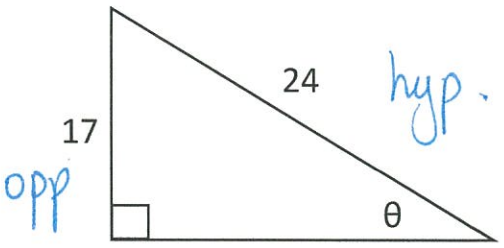
$\cos 42° = \frac{b}{23}$ 2

$b = 23 \cos 42°$

$= 17$

(4)

Q.11 For the following triangle,



1

(i) On the diagram, label the side lengths given as either opposite, adjacent or hypotenuse in relation to the angles.

(ii) State which ratio should be used to find θ.

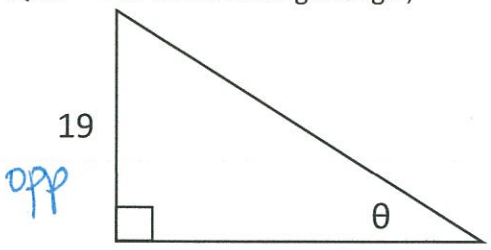
sin. 1

(iii) Put your values into the ratio formula and use it to find θ correct to the nearest degree.

$\sin\theta = \frac{17}{24}$ 2

$\theta = \sin^{-1}\frac{17}{24} = 45°$ (4)

Q.12 For the following triangle,



opp

adj 1

(i) On the diagram, label the side lengths given as either opposite, adjacent or hypotenuse in relation to the angles.

(ii) State which ratio should be used to find θ. tan 1

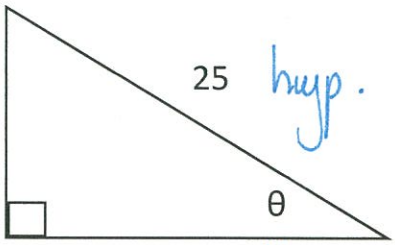
(iii) Put your values into the formula and use it to find θ correct to the nearest degree.

$\tan\theta = \frac{19}{12}$ 2

$\theta = \tan^{-1}\frac{19}{12}$ (4)

$= 58°$

Q.13



hyp.

adj 1

(i) On the diagram, label the side lengths given as either opposite, adjacent or hypotenuse in relation to the angles.

(ii) State which ratio should be used to find θ. cos 1

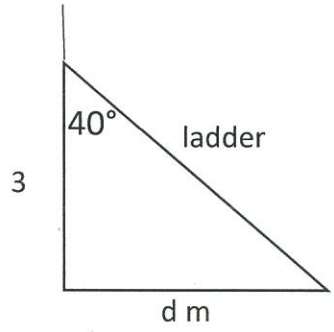
(iii) Put your values into the formula and use it to find θ correct to the nearest degree.

$\cos\theta = \frac{13}{25}$ 2

$\theta = \cos^{-1}\frac{13}{25}$ (4)

$= 59°$

Q.14 A window cleaner leans a ladder against the wall of a house. It makes an angle of 40° with the wall, and the top of the ladder is 3 metres above the ground.



How far from the base of the wall is the foot of the ladder?

$\tan 40 = \frac{d}{3}$ (2)

$d = 3\tan 40$

$= 2.517$

YEAR 9_5.2_TERM 3 TEST_ 2018

WORD BANK

Triangle classification by Angles:

Acute

Obtuse

Right Angled

Triangle classification by Sides:

Isosceles

Scalene

Equilateral

Angles on Parallel lines:

Corresponding

Alternate

Co interior

Vertically opposite

Angle Relationships

Complementary Angles

Supplementary Angles

Angles at a Point

Exterior angle of a triangle

Reasons for Congruence in Triangles:

SSS	SIDE – SIDE –SIDE
SAS	SIDE – ANGLE – SIDE
RHS	RIGHT ANGLE – HYPOTENUSE – SIDE
AAS	ANGLE – ANGLE – SIDE

TRIGONOMETRIC FORMULAE

$\sin\theta = \frac{\text{opp}}{\text{hyp}}$ $\cos\theta = \frac{\text{adj}}{\text{hyp}}$ $\tan\theta = \frac{\text{opp}}{\text{adj}}$