Name:

South Sydney High
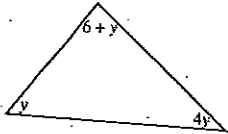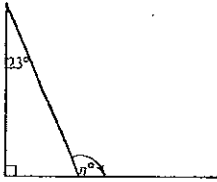### Year 9 Mathematics
Geometry

PART A: Multiple choice
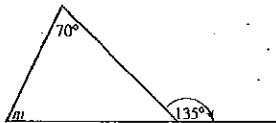
1 The value of the pronumeral y is:

- A 51°
- B 44°
- C 32°
- D 29°

2 The value of the pronumeral n is:

- A 23°
- B 67°
- C 113°
- D 167°

3 The value of the pronumeral m is:

- A 135°
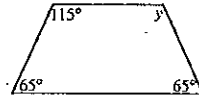- B 90°
- C 70°
- D 65°

4 A quadrilateral with all sides equal in length is called a:
- A rectangle
- B parallelogram
- C square
- D kite

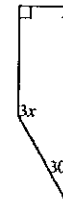**5** A quadrilateral with two pairs of adjacent sides equal is called a:
- A trapezium
- B parallelogram
- C square
- D kite
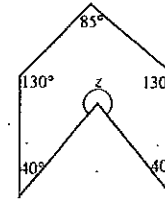
6 The value of the pronumeral y is:

- A 65°
- B 115°
- C 130°
- D 230°

7 The value of the pronumeral x is:

- A 30°
- B 45°
- C 60°
- D 80°

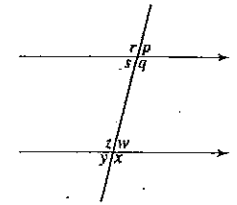Questions 8 and 9 refer to the following diagram.

8 The sum of the angles in the polygon is:
- A 540°
- B 720°
- C 900°
- D 1080°

9 The value of the pronumeral z is:
- A 425°
- B 85°
- C 115°
- D 295°

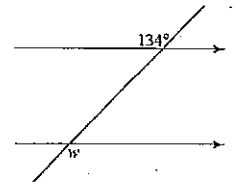Questions 10 and 11 refer to the following diagram.

10 State which angle is co-interior to angle s.
- A p
- B w
- C z
- D y

11 The angle which is vertically opposite to r is:
- A p
- B w
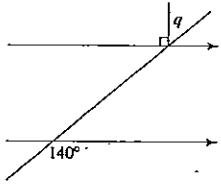- C q
- D z

12

The value of the pronumeral w is:
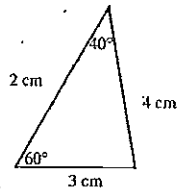- A 44°
- B 56°
- C 134°
- D 150°

13

The value of the pronumeral q is:
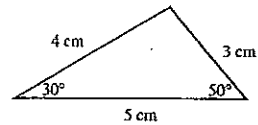A   45°
B   50°
D   120°
E   140°

14

The shape above is best described as:
A   a triangle with angles 60° and 40° and side between them of length 2 cm
B   a triangle with angles 60° and 60° and side between them of length 4 cm
C   a triangle with angles 40° and 80° and side between them of length 3 cm
D   a triangle with angles 40° and 40° and side between them of length 4 cm

15

The shape above is best described as:
A   a triangle with side lengths 4 cm and 3 cm with an angle 50° between them
B   a triangle with side lengths 3 cm and 5 cm with an angle 30° between them
C   a triangle with side lengths 5 cm and 5 cm with an angle 50° between them
D   a triangle with side lengths 4 cm and 5 cm with an angle 30° between them

16   The value of the angle which is *complementary* to 23° is:
A   130°
B   157°
C   67°
D   3°

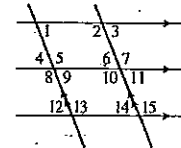**17**   The value of the angle a in the figure below is:
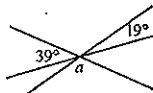
A   58°
B   32°
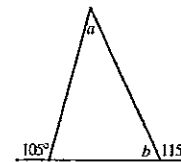C   19°
D   122°

18   Supplementary angles:
A   add up to 90 degrees
B   add up to 180 degrees
C   are not equal
D   are co-interior angles

19   Two angles which are *co-interior* to angle 9 in the figure below are:

A   Angles 5 and 8
B   Angles 5 and 1
C   Angles 6 and 14
D   Angles 1 and 13

20   The values of the angles a and b in the figure below are:
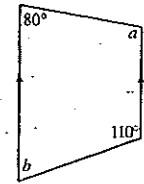

A $a = 40°, b = 65°$
B $a = 40°, b = 75°$
C $a = 90°, b = 65°$
D $a = 30°, b = 65°$

21   The sum of the interior angles of a hexagon is:
A   360°
B   540°
C   720°
D   900°

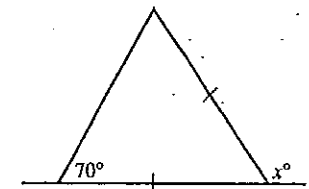**22**   The values of the angles a and b in the figure below are:

A $a = 80°, b = 110°$
B $a = 110°, b = 80°$
C $a = 100°, b = 70°$
D $a = 85°, b = 85°$

23   Angles which add up to 90° are called:
A   obtuse angles
B   reflex angles
C   complementary angles
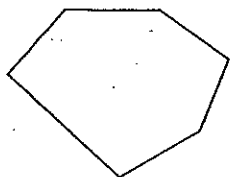D   supplementary angles

24   The value of $x°$ is:

A   40°
B   70°
C   120°
D   140°

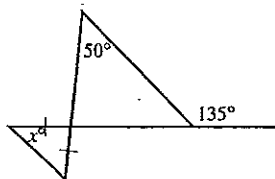**25** The size of each interior angle in a regular octagon is:

A   108°
B   120°
C   135°
D   180°

26 In the diagram shown the sum of the interior angles is equal to:
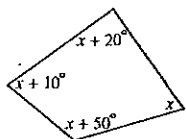
A   540
B   720
C   900
D   1080

27 The value of $x°$ in the figure shown is:

A   45°
B   47.5°
C   85°
D   95°

28

Which of the following statements is true?

A $x + 50° = x + 20°$
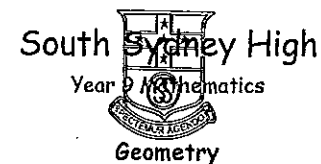B $4x + 80° = 360°$
C $x = x + 10°$
D $4x = 180°$

29 In which one of the following shapes are the diagonals always equal?

A   a rhombus
B   a rectangle
C   a trapezium
D   a parallelogram

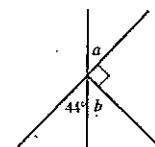**30** Which of the following characteristics does not belong to a rhombus?

A   Diagonals intersect at 90°.
B   Opposite sides are parallel.
C   Adjacent angles add to 90°.
D   All sides are of equal length.

PART B: GIVE REASONS AND SHOW ALL WORKING OUT FOR EACH QUESTION

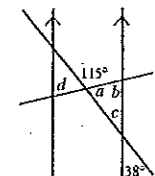|	
1 Find the values of the angles a and b in the figure below.	
2 Determine the value of the pronumeral a in the figure below.	
3 Find the values of the angles a, b and c as shown in the figure below.	
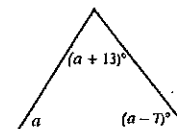
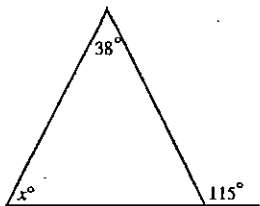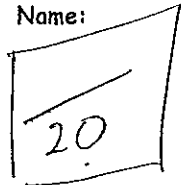|	
4 Find the value of the exterior angles. (a) 37° 99° x (b) 20° y 140°	
5 Find the size of the angle marked x°, giving a brief reason. 38° x° 115°	
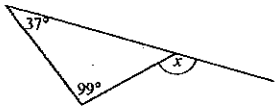
6   (a)   Draw a shape with 4 sides where
        there is only one pair of parallel
        sides.
 	
(b)   How would you best describe this
        shape?	

GEOMETRY ANSWERS PART A

1	D		16	C
2	C		17	D
3	D		18	B
4	C		19	D
5	D		20	A
6	B		21	C
7	C		22	C
8	B		23	C
9	D		24	D
10	C		25	C
11	C		26	B
12	C		27	B
13	B		28	B
14	A		29	B
15	D		30	C

PART B: GIVE REASONS AND SHOW ALL WORKING OUT FOR EACH QUESTION
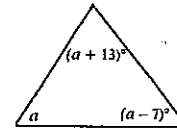
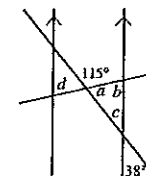**1** Find the values of the angles a and b in the figure below.
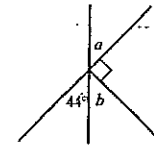
$a = 44°$ ($\because$ Vertically opp $\angle$'s) ✓

$b + 44 + 90° = 180$ ($\because$ supp $\angle$'s) ✓

$b + 134 = 180$

$b = 46°$ ✓

③

2 Determine the value of the pronumeral a in the figure below.

$a + a + 13 + a - 7 = 180°$ ($\because \angle$ sum of $\triangle = 180°$) ✓

$\therefore 3a + 6 = 180°$ ✓

$3a = 174$

$a = 58°$ ✓

③

3 Find the values of the angles a, b and c as shown in the figure below.

$a + 115 = 180°$ ($\because$ supp $\angle$'s) ✓

$\therefore a = 65°$ ✓

$c = 38°$ ($\because$ Vert opp. $\angle$'s) ✓

$b + a + c = 180°$ ($\because \angle$ sum of $\triangle$) ✓
$b + 65 + 38 = 180$
$b + 103 = 180°$ ✓
$\therefore b = 77°$ ✓

⑥

$d = b = 77°$ ($\because$ alt $\angle$'s) ✓
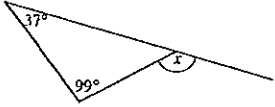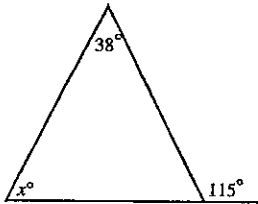
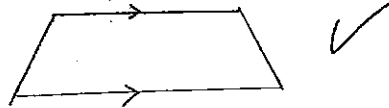|	
4 Find the value of the exterior angles. (a) 37° 99° x	$x = 37 + 99$ $\left(\because \text{Ext } \angle \text{ of } \Delta = \text{sum of } 2 \text{ opp int}\right)$ ✓ $x = 136°$ ✓
(b) 20° 140° y	$y = 140 + 20°$ $\left(\because \text{Ext } \angle \text{ of } \Delta = \text{sum of } 2 \text{ opp int}\right)$ $\therefore y = 160$ (4)
5 Find the size of the angle marked x°, giving a brief reason. 38° $x°$ 115°	$x + 38 = 115$ $\left(\because \text{Ext } \angle \text{ of } \Delta = \text{sum of } 2 \text{ opp int}\right)$ ✓ $\therefore x = 77°$ ✓ (2)
6 (a) Draw a shape with 4 sides where there is only one pair of parallel sides. (b) How would you best describe this shape?	✓ (2) TRAPEZIUM ✓