

Name _____

Teacher _____

Sydney Technical High School



Mathematics

Year 7

Yearly Exam 2009

All working to be shown

Calculators may be used

Time allowed: 70 minutes

		Total Marks	
Part A	Algebra	15	
Part B	Geometry	23	
Part C	Measurement	25	
Part D	Directed Number	35	
Part E	Angles	6	
Total		104	

Part A
Further Algebra

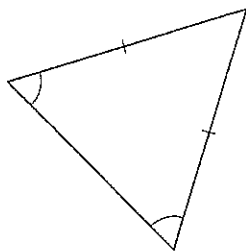
15 marks

<p>Simplify the following:</p> <p>1. $4a - 6a$</p>		<p>Solve the following:</p> <p>2. $3x = 24$</p>	
<p>3. $-5x + 6x$</p>		<p>4. $5m + 3 = 18$</p>	
<p>5. $5a + 5 - 2a - 8$</p>		<p>6.</p> $\frac{n}{6} = 6$	
<p>7. $18b \div 3$</p>		<p>8. If $E = mc^2$ find E when $m = 3$ and $c = 5$</p>	
<p>9. $6a \times 3b$</p>		<p>10. If $P = 2(l + b)$, find P given that $l = 10$ and $b = 3$</p>	
<p>11. $a^3 \times a^8$</p>		<p>12. $(-3t)^2$</p>	
<p>13. Rewrite in simplest form: $3 \times m \times m \times m$</p>		<p>14. A bus has 34 passengers and x get on at the next stop. How many passengers are now on the bus?</p>	
<p>15. Write in algebraic form: 'twice a subtract b'</p>			

Part B Geometry – Solids

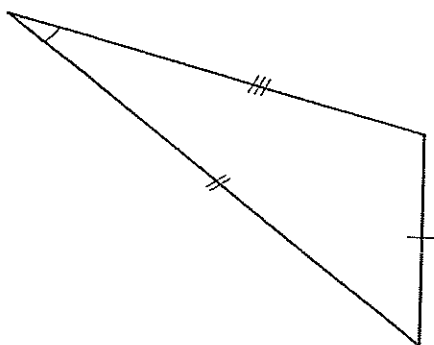
23 Marks

1. Name the following triangles by considering the length of the sides.

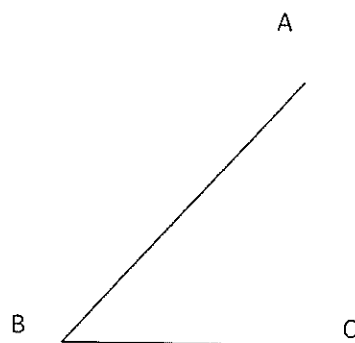


(a)

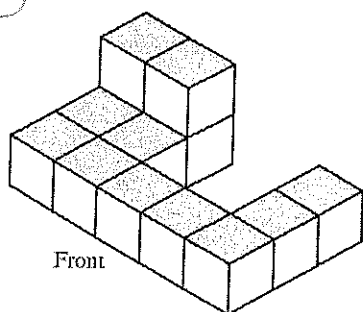
(b)



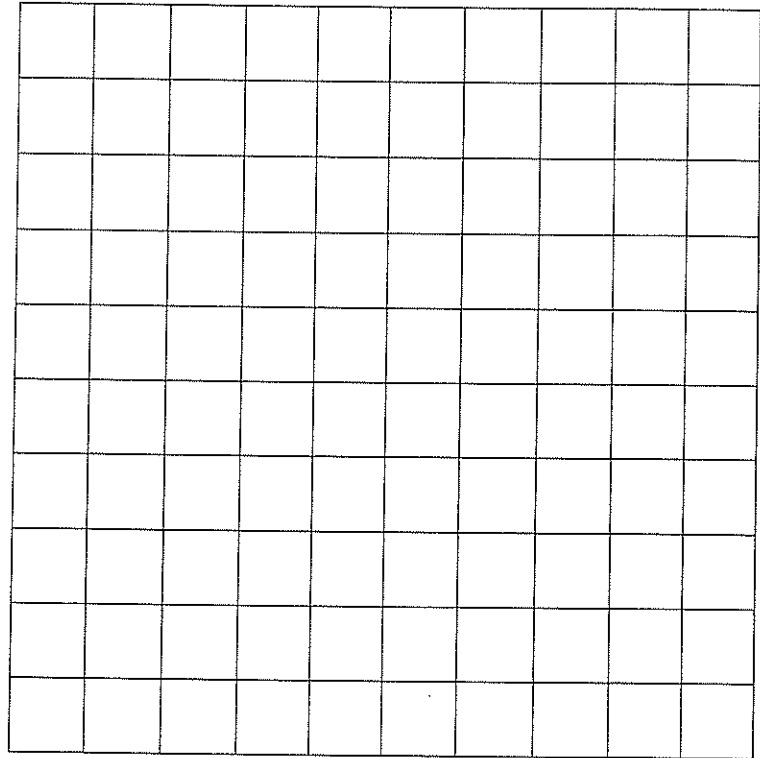
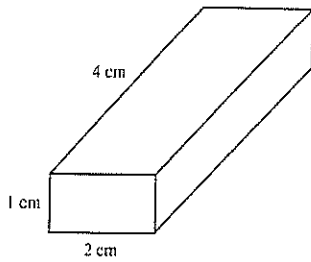
2. Measure the acute $\angle ABC$ shown below:



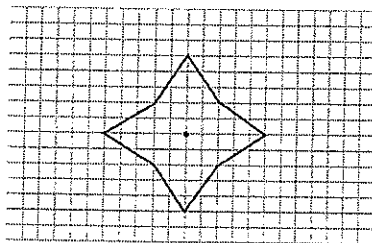
3. Draw the top view of this figure



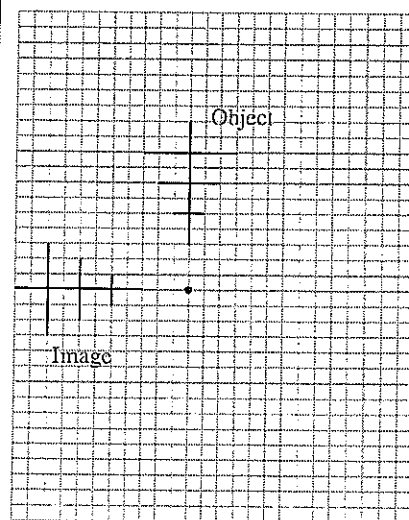
4. Using a ruler draw the net of this figure



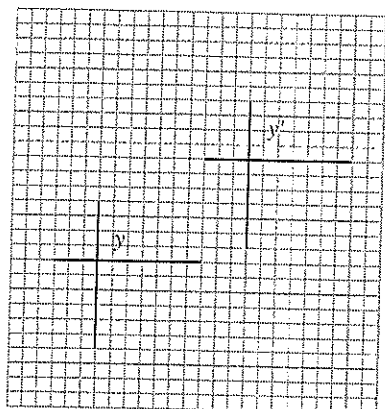
5. The smallest rotation needed for the image to be the same as the object in the figure below is:



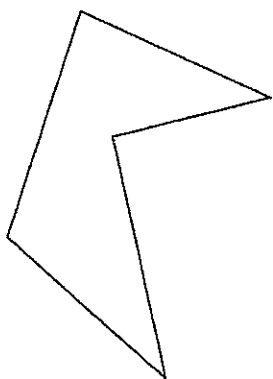
6. The rotation about the dot that has taken place in the figure below is:



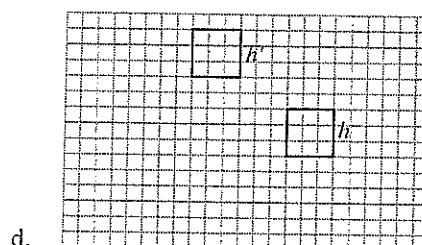
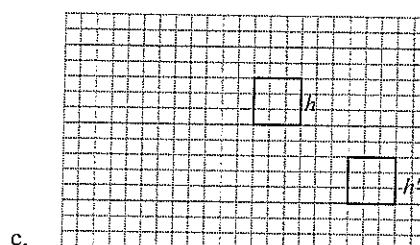
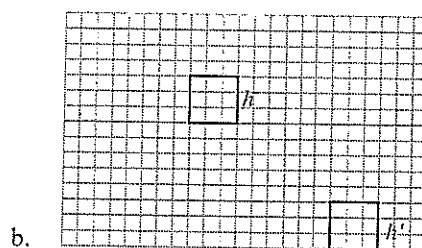
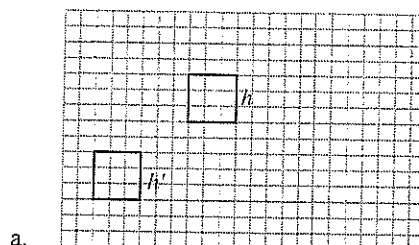
7. Describe the translation shown below:



8. The name given to the polygon below is:

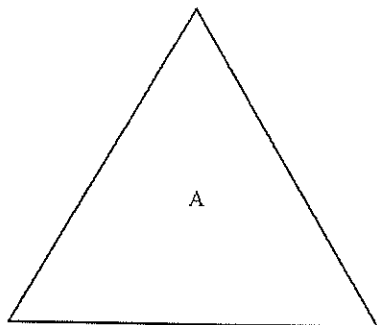


9. The object h has undergone a translation of 5 units down, 6 right. The image h' would appear as:



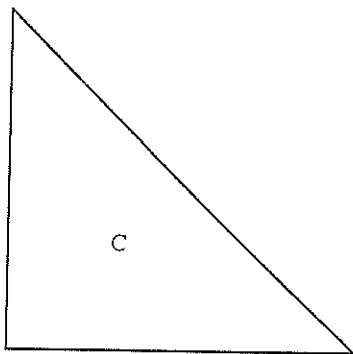
10. Use the triangles below to show **angle markings** and **side markings** to make the triangles:

(a)



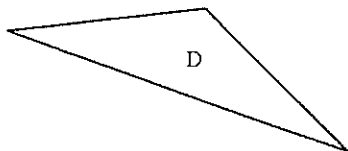
triangle A is equilateral

(b)



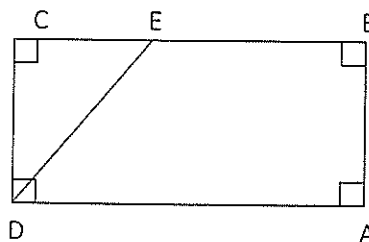
triangle C is right-angled and isosceles

(c)



triangle D is isosceles and obtuse-angled.

11.



From the diagram name:

(a) an acute angle

(b) an obtuse angle

(c) a right angle

(d) a straight angle

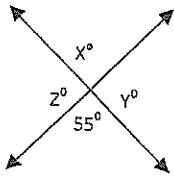
(e) a pair of complementary angles

(f) a pair of supplementary angles

(g) If $\angle CDE = 40^\circ$, find the size of $\angle EDA$.

(h) If $\angle BED = 120^\circ$, find the size of $\angle DEC$.

12. Find the value of each of the pronumerals.
Give a brief reason in each case.



(2 marks)

Part C Measurement

25 Marks

1. Convert the following units to the given units

(a) 4 m = _____ cm

(d) 64 mm = _____ cm

(b) 3 km = _____ m

(e) 3 400 000 mm = _____ km

(c) 7000 mm = _____ m

(f) 0.35 km = _____ m

2. Complete the following using sensible units:

a) Length of pen = 15 _____

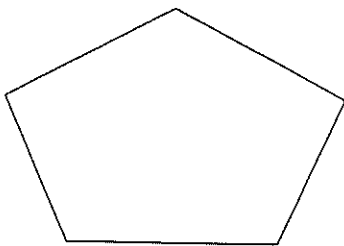
b) Height of door = 2 _____

c) Broken Hill to Adelaide = 500 _____

d) Length of finger nail = 11 _____

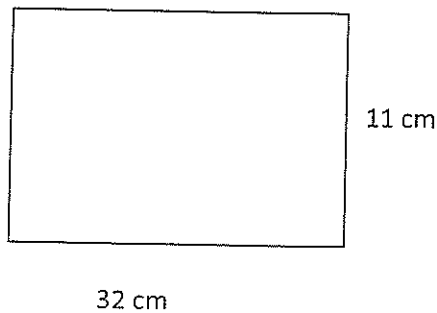
3. Measure the perimeter of this shape with your ruler, leaving your answer in cms.

(a)

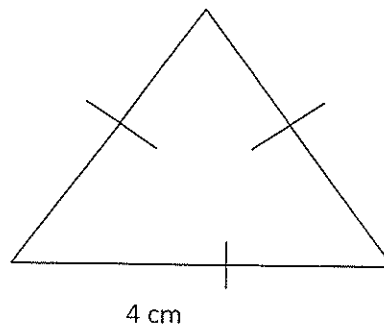


4. Find the perimeter of the following:

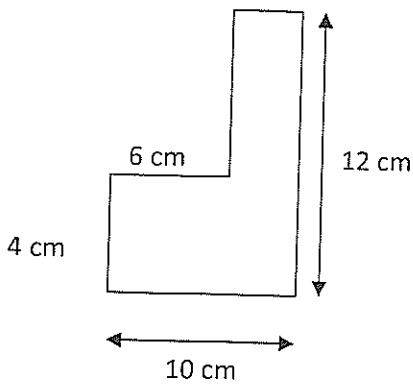
(a)



(b)



5. Find the perimeter of the following shape:



6. List the months which have 30 days.

7. Here is a local bus timetable:

(a) How long is the bus ride from William St to City Centre?

(b) If the bus is 5 minutes late, what time will it arrive at the City Centre?

(c) Fiona catches a later bus, which travels the same route at the same speed. If it leaves Cummins St at 7:42, what time will it reach City Centre?

William St	4:39
Brazil St	4:48
Cummins St	5:02
Cummins Lane	5:17
McGowen St	5:22
Redwood Rd	5:29
City Centre	5:36

8. Express in 12 hour digital time: **21:19 hours**

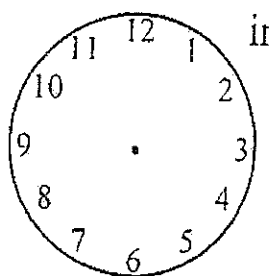
9. A timber worker cuts a log across its diameter into four pieces in 12 minutes. At this rate, how many minutes would it take him to cut another log of the same diameter into 6 pieces?

(2 marks)

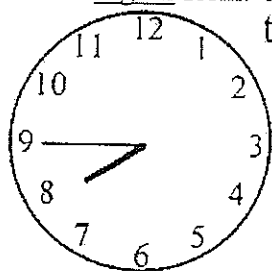
10. In winter in Australia, the Eastern time zone (E) is a half an hour ahead of the Central time zone (C) which is one and a half hours ahead of the Western time zone (W). If it is 3 p.m. in Sydney (E), what time is it in:
- (a) Broken Hill (C)

(b) Perth (W)

11. Draw "twenty to seven" in the clock face below.



12. Write the time shown in the clock face below in digital form. Assume it is evening.



Part D Directed Number

35 Marks

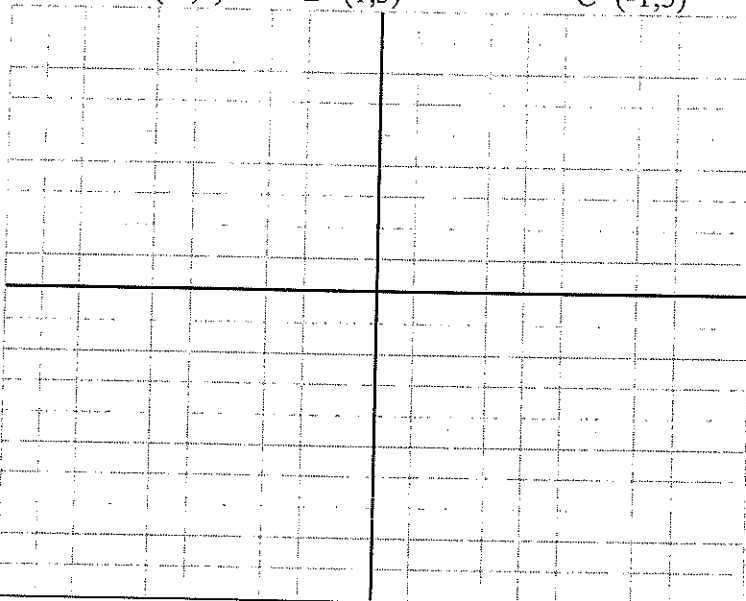
<p>1. Insert $>$ or $<$ to make these statements true:</p> <p>a. $-6 \square -4$</p> <p>b. $0 \square -4$</p>	<p>2. Simplify these algebraic expressions:</p> <p>a. $6a - 11a =$</p> <p>b. $-2a - 4a + 11a$</p> <p>c. $4y - 3x + y - 2x =$</p>
<p>3. Arrange in ascending order</p> <p>$-1, -8, -3, 4, 1, 0$</p>	<p>4. Simplify:</p> <p>a. $-8 \times 4y =$</p> <p>b. $-6a \times 4a =$</p> <p>c. $\frac{-8y}{4} =$</p> <p>d. $9t \times -3s =$</p> <p>e. $(-8y)^2 =$</p> <p>f. $-6a^3 \times 8a^4 =$</p>
<p>5. Work out the value of</p> <p>a. $-3 + (-4) =$</p> <p>b. $-2 + 7 + -4 =$</p>	
<p>6. Complete these statements to make them true:</p> <p>a. $-4 + \square = 2$</p> <p>b. $\square + -5 = -7$</p>	
<p>7. Find the total of $-6, 4$ and -2</p>	
<p>9. Work out the values of the following:</p> <p>a. $-6 - 7 =$</p> <p>b. $6 - 14 =$</p> <p>c. $-3 - (-7) =$</p>	<p>8. If $a = -6, b = 4, c = -3$, evaluate the following expressions:</p> <p>a. $a + b$</p> <p>b. a^2</p> <p>c. abc</p> <p>d. $4 - a$</p> <p>e. $(a + b)(a + c)$</p>
<p>10. Evaluate:</p> <p>a. $6 - 3 \times 4 =$</p> <p>b. $-8 \times 2 + 6 \times -3 =$</p> <p>c. $-18 - (-24) \div 3 =$</p>	

11. In a chemistry experiment the temperature of a liquid rises 12°C , falls 15°C , rises 9°C , rises 7°C and falls 11°C . By how much is the current temperature above or below the initial temperature of the liquid?

12. Complete the table of values:
 $y = 2x + 1$

x	-1	0	1	2
y				

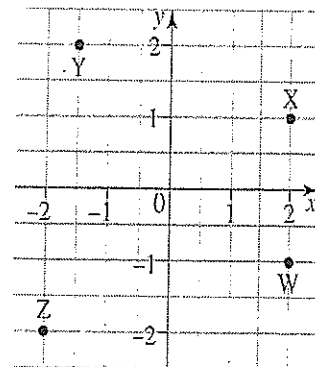
13. On the graph paper below plot the following points and label them accordingly:
 $A = (-2, 0)$ $B = (1, 3)$ $C = (-1, 3)$ $D = (3, -2)$



14. What is the rule for the following table of values?

x	-2	-1.5	-1	-0.5	0	0.5	1.0
y	-1	0	1	2	3	4	5

15. Give the coordinates of the midpoint of interval XW.



Part E Angles

6 Marks

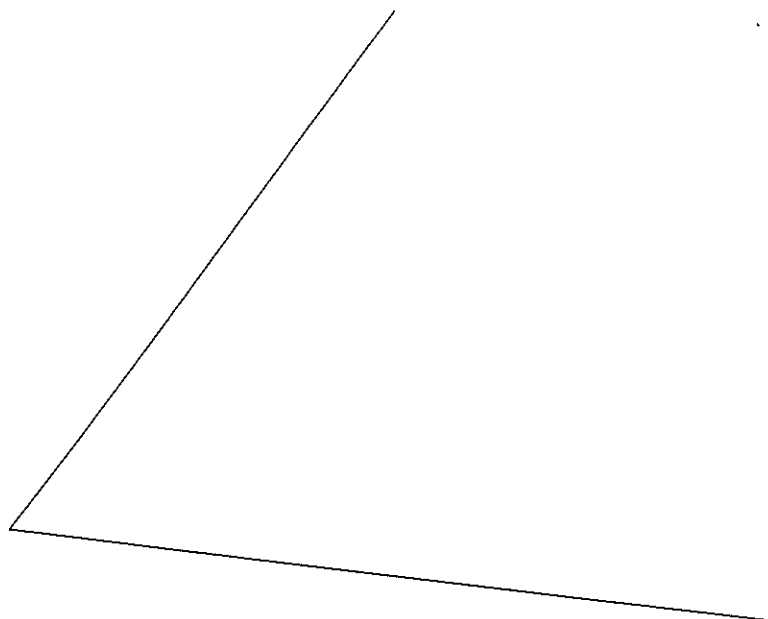
1. Construct a triangle ABC with $AB = 3\text{cm}$, $BC = 5\text{cm}$ and $AC = 4\text{ cm}$.

(2 marks)

2. Construct an angle of 60°

2 marks

3. By using a compass and ruler bisect the following angles



(2 marks)

Name _____

Teacher (MATHS) _____

Sydney Technical High School



MATHEMATICS

YEAR 7

YEARLY EXAM 2009

(Multiple Choice)

30 marks

Circle the correct answer on the answer sheet provided
Time allowed 30 mins

1	A	B	C	D
2	A	B	C	D
3	A	B	C	D
4	A	B	C	D
5	A	B	C	D

6	A	B	C	D
7	A	B	C	D
8	A	B	C	D
9	A	B	C	D
10	A	B	C	D

11	A	B	C	D
12	A	B	C	D
13	A	B	C	D
14	A	B	C	D
15	A	B	C	D

16	A	B	C	D
17	A	B	C	D
18	A	B	C	D
19	A	B	C	D
20	A	B	C	D

21	A	B	C	D
22	A	B	C	D
23	A	B	C	D
24	A	B	C	D
25	A	B	C	D

26	A	B	C	D
27	A	B	C	D
28	A	B	C	D
29	A	B	C	D
30	A	B	C	D

YEAR 7
YEARLY 2009

Name: _____

Teacher: _____

Circle Correct answer on Answer Sheet

1.

A school day begins at 8.52 am and finishes at 3.15 pm.

How many hours and minutes are in this school day?

- (A) 5 hours and 37 minutes
- (B) 6 hours and 23 minutes
- (C) 6 hours and 37 minutes
- (D) 7 hours and 23 minutes

2.

Simplify $3n - 15 + 2n - 2$.

- (A) $n - 17$
- (B) $5n - 13$
- (C) $5n - 17$
- (D) $5n + 17$

3.

Which of the following groups is arranged from smallest to largest?

- (A) 0.705, 72%, $\frac{3}{4}$
- (B) 72%, 0.705, $\frac{3}{4}$
- (C) 0.705, $\frac{3}{4}$, 72%
- (D) $\frac{3}{4}$, 0.705, 72%

4.

Which of the following is seven million, twenty thousand and forty?

- (A) 702 400
- (B) 720 040
- (C) 7 002 040
- (D) 7 020 040

5.

Sydney is 2 hours behind Fiji. A plane leaves Sydney at 8.00 am and flies to Fiji. The flight takes 4 hours and 30 minutes.

What time is it in Fiji when the plane arrives?

- (A) 2.30 pm
- (B) 10.30 am
- (C) 12.30 am
- (D) 12.30 pm

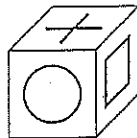
6.

Simplify $a^6 \div a^2$.

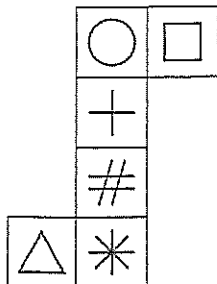
- (A) 1^3
- (B) 1^4
- (C) a^3
- (D) a^4

7.

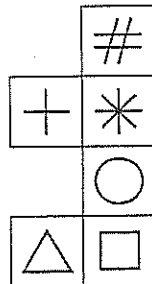
Which of the following nets could be folded to make the cube shown?



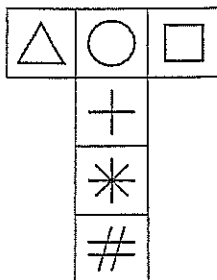
(A)



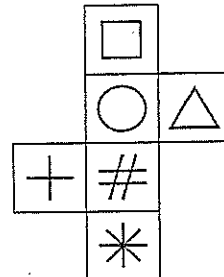
(B)



(C)



(D)



8.

Tarryn is 15 years and 11 months old on 14 November 2006.

When was Tarryn born?

- (A) 14 October 1990
- (B) 14 December 1990
- (C) 14 October 1991
- (D) 14 December 1991

9.

If $a = 3$, what is the value of $2a^3$?

- (A) 18
- (B) 54
- (C) 125
- (D) 216

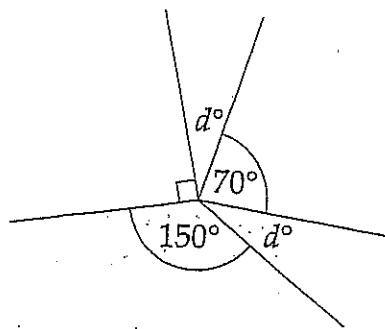
10.

The Melbourne Cup is held on the first Tuesday in November each year.

Which of the following dates in November is NOT a possible date for the Melbourne Cup?

- (A) 5th
- (B) 6th
- (C) 7th
- (D) 8th

11.

NOT
TO
SCALEWhat is the value of d ?

(A) 25

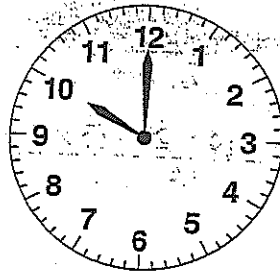
(B) 35

(C) 50

(D) 70

12.

An electric clock stopped when the electricity was turned off at 10 am.



Five hours later the time shown on this clock was 2 pm.

For how long was the electricity turned off?

(A) 1 hour

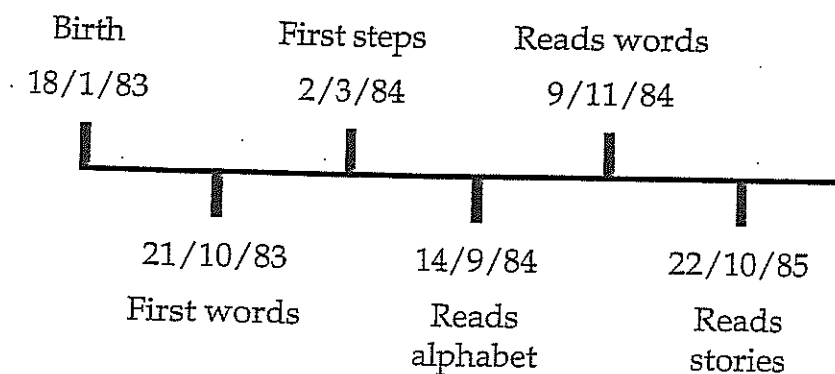
(B) 3 hours

(C) 4 hours

(D) 5 hours

13

Recorded stages of Erica's development

NOT
TO
SCALE

Which stage of Erica's development was the longest?

(A) From birth to first words

(B) From first words to first steps

(C) From reads alphabet to reads words

(D) From reads words to reads stories

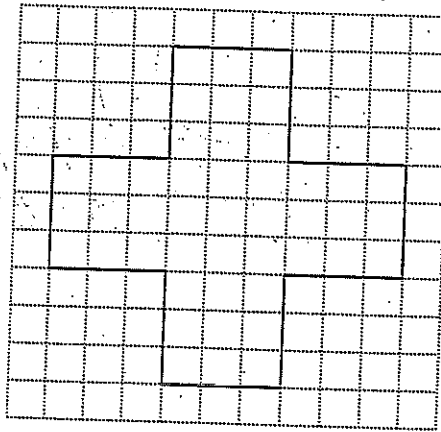
14.

Which of the following is NOT a property of a rectangle?

- (A) Adjacent sides are equal.
- (B) All angles are equal.
- (C) Diagonals bisect each other.
- (D) Opposite sides are parallel.

15.

How many axes of symmetry does this shape have?



(A) 1

(B) 2

(C) 3

(D) 4

16.

Jenny hired a taxi to travel home from work. The distance from her work to home is 21 kilometres. A hiring fee of \$2.75 was charged, plus \$1.56 per kilometre travelled.

Jenny gave the driver \$40.

How much change (to the nearest 5 cents) should Jenny receive?

(A) \$4.50

(B) \$7.25

(C) \$32.75

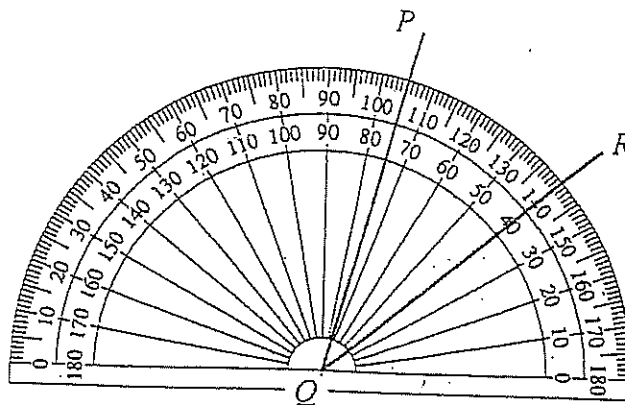
(D) \$35.50

17.

Enrico spent yesterday in Thredbo. The temperature at 6 am was -3°C . Between 6 am and 6 pm the temperature rose by 7°C and then fell by 10°C .

What was the temperature at 6 pm?

(A) -20°C (B) -6°C (C) 0°C (D) 14°C



The size of angle PQR is

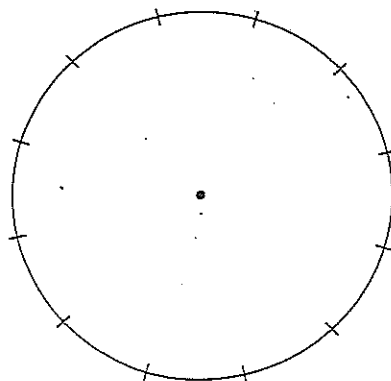
- (A) 25° (B) 35° (C) 45° (D) 65°

19. A discount voucher offered 25% discount, up to a maximum discount of \$15. Daniel bought goods to the value of \$80 and Naomi bought goods to the value of \$40. They each had a discount voucher.

How much more money did Daniel pay than Naomi?

- (A) \$5 (B) \$10 (C) \$30 (D) \$35

20. Ali wants to inscribe a regular polygon in this circle. He marks 12 equally spaced points on the circumference.



Which regular polygon can he NOT make from this construction?

- (A) Equilateral triangle (B) Hexagon
(C) Octagon (D) Square

- 21 The time in Maitland is $\frac{1}{2}$ hour ahead of the time in Broken Hill. The time in Albany is $1\frac{1}{2}$ hours behind the time in Broken Hill.
- When the time in Maitland is 13:30, what is the time in Albany?
- (A) 11:30 (B) 12:30 (C) 14:30 (D) 15:30

- 22 A balba tree grows $2\frac{1}{2}$ cm each year. Approximately how many years old will the tree be when it stands 3 m tall?
- (A) 83 (B) 120 (C) 830 (D) 1200

- 23 The annual membership fee at Jerry's golf club is \$345 and it costs \$15 to play each game. Jerry's golf budget for 2005 is \$900.
- How many games of golf will Jerry be able to play at his club in 2005?
- (A) 23 (B) 37 (C) 60 (D) 83

- 24 Aisha is looking at a map of caves.
- Jimbo cave is 90 m below ground level.
Lateral cave is 50 m higher than Cathedral cave.
Jimbo cave is 20 m lower than Lateral cave.
- How far below ground level is Cathedral cave?
- (A) 60 m (B) 120 m (C) 140 m (D) 160 m

- 25 The formula for the perimeter of a rectangle is
- $$P = 2\ell + 2b.$$
- What is the value of b when $\ell = 5$ and $P = 40$?
- (A) 15 (B) 25 (C) 30 (D) 35

- 26 When he climbed a 60 m tree, Ross climbed 140 rungs on his ladder. He plans to climb a 75 m tree.
- How many rungs will be on the ladder?
- (A) 155 (B) 175 (C) 200 (D) 215

27




One year from now, Naomi will be one third of her mother's age. Her mother is now 38 years old.

In how many years from now will Naomi be half her mother's age?

- (A) 12 (B) 13 (C) 14 (D) 15

28

The following table links the number of sides of a polygon to its angle sum.

Polygon	Number of sides	Angle sum
	3	$1 \times 180 = 180^\circ$
	4	$2 \times 180 = 360^\circ$
	5	$3 \times 180 = 540^\circ$

How many sides are there on the polygon with an angle sum of 1080° ?

- (A) 6 (B) 7 (C) 8 (D) 10

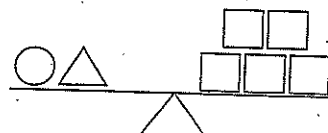
29

Which of these expressions is equivalent to $3mn^2$?

- (A) $3 \times m \times n \times n$ (B) $3 \times m \times n \times 2$
 (C) $3 \times m \times n \times m \times n$ (D) $3 \times m \times n \times 3 \times m \times n$

30.

The balances show the relationships between the masses of three objects.



Arrange the three objects from heaviest to lightest.

- (A) $\triangle, \bigcirc, \square$ (B) $\bigcirc, \square, \triangle$
 (C) $\square, \triangle, \bigcirc$ (D) $\triangle, \square, \bigcirc$

C

C

Year 7 Mathematics (Non-Calculator Section)

2009 Yearly Exam

Name _____

Teacher (MATHS) _____

Write all answers on the sheet in the answer column.

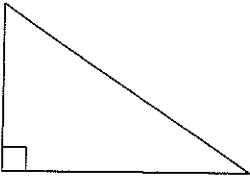
Time: 30 minutes (30 marks)

30 x 1 mark questions	Answers (only)
1. Simplify the following: $6 \times (2+1) \div 9$	
2. Write $\frac{3}{1000}$ as a decimal	
3. What time is 3 hours 20 minutes later than 4:55am?	
4. Sue spends 55c. What is her change from \$1.00?	
5. How many minutes from 10.30a.m. till 11.15 a.m?	
6. Add 7 and 5 and double the answer.	
7. What number is 10 greater than 99?	
8. Simplify $3m + 2 - m$	
9. Evaluate $(4 + 6) + 5 \times (3 + 2)$	
10. What is the cost of 6 books at 90c each?	
11. Share 72 comics between 8 girls.	
12. Solve: $x + 7 = 12$	
13. Which is greater 30×40 or 1000?	
14. Simplify using index notation $a \times a \times b \times b \times b \times b$	

Year 7 Mathematics Quiz

2009

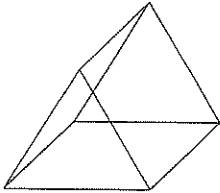
Name _____

15. If $a = 3$ and $b = 2$, find the value of the expression $a^2 - 2ab$	
16. How many axes of symmetry does a rectangle have?	
17. What type of angle is an angle that is less than 90° ?	
18. Are angles of 55° and 35° complementary angles? (Answer yes or no)	
19. How many days from April 20th till May 7 th ? (inclusive)	
20. A square has sides of 3 cm. What is its perimeter?	
21. A car travels at 80 km/h. How far does it go in $\frac{3}{4}$ hour?	
22. What type of triangle? 	
23. Write 3.30 p.m. in 24 hour time.	
24. Expand $x(3x+1)$	
25. List the months which have 30 days.	

Year 7 Mathematics Quiz

2009

Name _____

26. In a state election, four regional centres were telephoning their voting results into a central polling area. If the results given for one party were 2347, 8944, 23 781 and 15 980, the total number of votes the party received was:	
27. Name this shape: 	
28. If $x = 4$, find the value of $x^2 + 3$	
29. Find $-5 + 3 - 10$	
30. Write down the next three numbers in the pattern 1, 4, 9, 16,	

