Name: ..... Teacher: .....

SYDNEY TECHNICAL HIGH SCHOOL

Year 8
Mathematics

Yearly

Part 1

September, 2015

Time allowed: 70 minutes

General Instructions:

- Write using blue or black pen
- Approved calculators may be used
- Use pencil to draw or complete graphs and diagrams
- Enter all your answers on the answer sheet provided

Section 1	Multiple Choice Questions 1-30 30 Marks
Section II	Questions 31-35 25 Marks

Section One – Multiple Choice

Fill in your answers on the answer sheet supplied.

1. An article is sold for \$45.00. This represents a gain of 28% on the cost price. The cost price is:

   (A) \$12.60 (B) \$32.40 (C) \$57.60 (D) \$35.16

2. One digit is missing from the stem and leaf plot below. Its position is shown by ▲

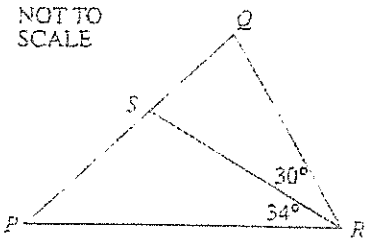
   The mean of all the scores is 15.

0	6 7 7
1	2 ▲ 6 8 9
2	0 0 1 2

   The missing digit is:

   (A) 2 (B) 4 (C) 5 (D) 6

3.



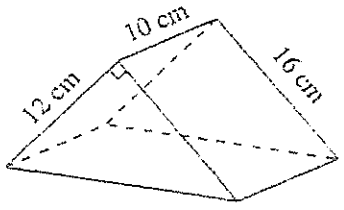
If $PQ = PR$, what is the size of $\angle PSR$?

(A) 82°
(B) 86°
(C) 94°
(D) 112°

4. A gardener used $1000m^3$ of soil to re-surface a smooth, level field to a uniform depth. The area of the field is $33000m^2$. The depth in millimetres of this soil is closest to

   (A) 0.03 (B) 3 (C) 30 (D) 33

5. The diagram shows a triangular prism. The area of the shaded rectangular face is



(A) $120cm^2$
(B) $160cm^2$
(C) $192cm^2$
(D) $200cm^2$

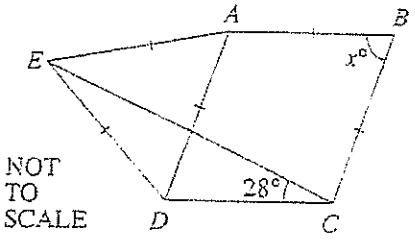
6. Hua is x years old. Tanya is 6 years older than Hua. Rosa is 3 years older than Tanya. The total of the ages of Hua, Tanya & Rosa is 45 years. Which equation best represents this information?

(A) $x + 9 = 45$ (B) $x + 15 = 45$ (C) $3x + 9 = 45$ (D) $3x + 15 = 45$

7. Solve $-3x \leq 8 - x$

(A) $x \leq 4$ (B) $x \geq -4$ (C) $x \geq 2$ (D) $x \leq -2$

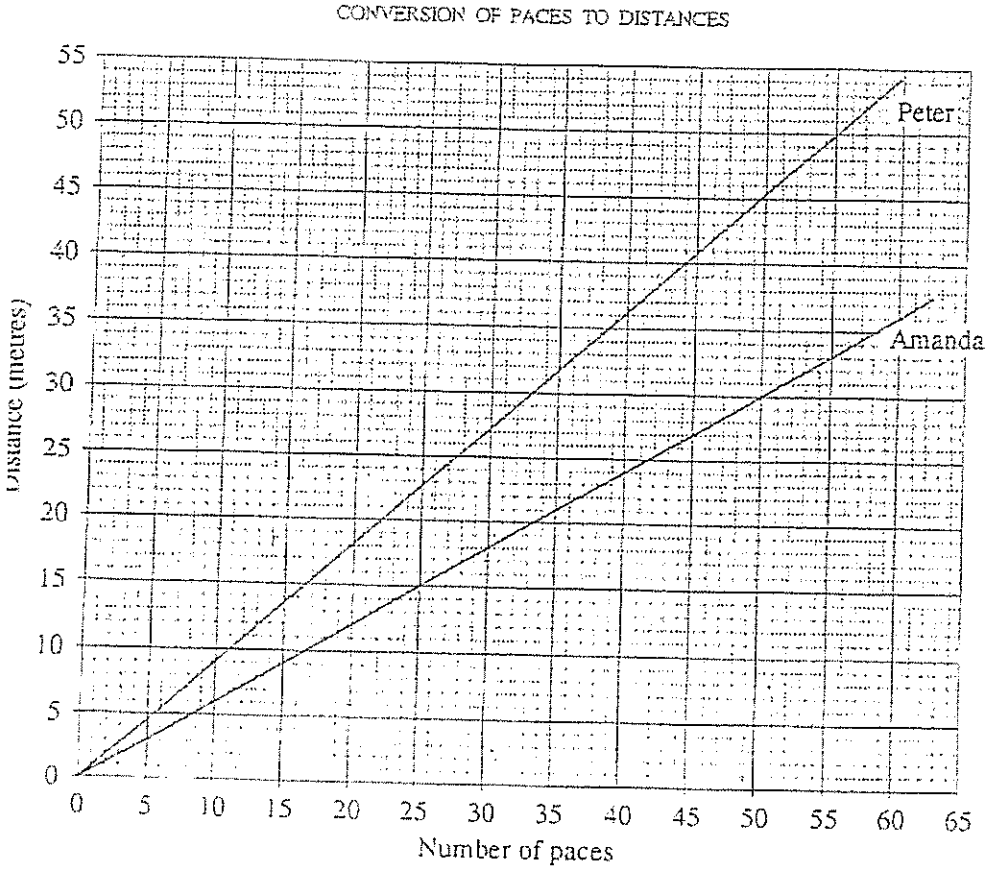
8. ABCD is a rhombus. DEA is an equilateral triangle. Find the value of x.



(A) 56°
(B) 60°
(C) 62°
(D) 64°

9. Amanda took 50 paces to estimate the length of the school hall. According to this conversion graph, how many paces would Peter take to estimate the length of the school hall ?

(A) 30 (B) 33 (C) 45 (D) 55



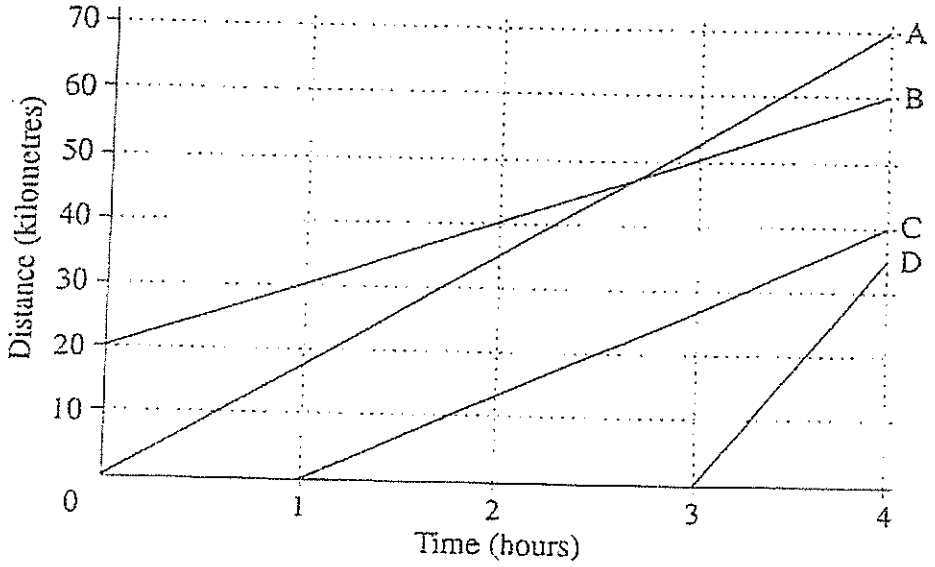
10. What is the difference between the mode and mean of these scores ?

30, 50, 60, 30, 70

(A) 2 (B) 12 (C) 18 (D) 20

USE THIS GRAPH TO ANSWER QUESTIONS 11 AND 12.

The graph represents the journeys of four cyclists.



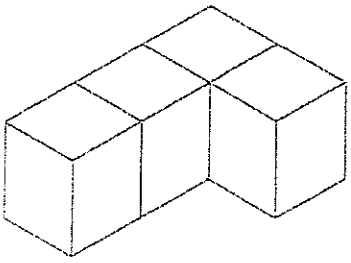
11. Which cyclist was travelling the fastest?

(A) (B) (C) (D)

12. What is the average speed for cyclist B?

(A) 10km/h (B) 15km/h (C) 40km/h (D) 60km/h

13. Four cubes with sides 1cm are used to make this solid. The surface area of the solid is



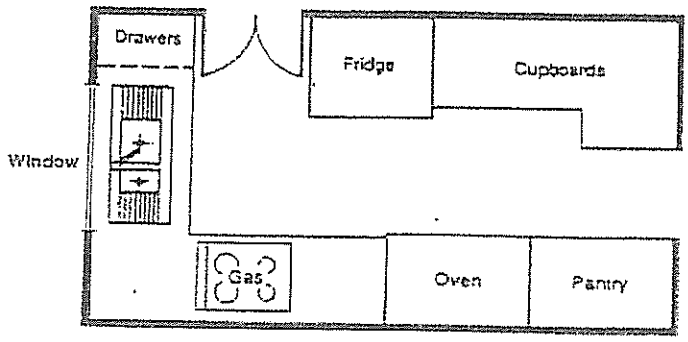
(A) $9cm^2$

(B) $13cm^2$

(C) $14cm^2$

(D) $18cm^2$

14. Below is the plan for a new kitchen.



SCALE 1 : 50

Use the scale to find the width of the window.

(A) 1.9cm (B) 47.5cm (C) 0.95m (D) 1.9m

15. A score of 15 is added to this sample. Which of these measures will change?

Score	Frequency
11	2
12	4
13	6
14	1
15	1

(A) Mean (B) Mode (C) Median (D) Range

16. Given that $a = 5.6,\ b = -3.2,\ and\ c = -4.8$, the value of $2ab^2 - c$ is:

(A) 16.768 (B) 109.888 (C) -119.488 (D) 119.488

17. Simplify: $3 - (x + 2) - 2(x - 3)$

(A) $7 - 3x$ (B) $11 - 3x$ (C) $-5 - 3x$ (D) $7 + x$

18. Chris bought a lounge which cost $2400 before the sale. A further 10% was taken off the sale price because Chris paid cash. How much did he pay?

(A) $960 (C) $1512

(B) $1440 (D) $1680

19. The expression $4x - \frac{10x}{5}$ is equivalent to:

(A) $2x$ (B) $-\frac{6x}{5}$ (C) $-\frac{6}{5}$ (D) $10x$

20. A close approximation for $(\frac{13.6+28.3}{5.1})^2$ is:

(A) 400 (B) 900 (C) 70 (D) 40

21. Australia's population is 22.5 million and its surface area is 7.68 x $10^6 km^2$. The average number of people per square kilometre is approximately:

(A) 3 (B) $\frac{1}{3}$ (C) 23 (D) 134

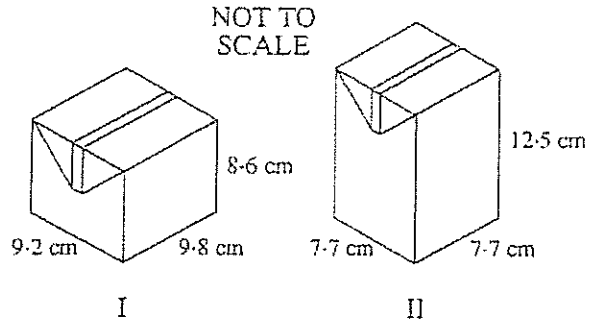
22. A triangle has angles in the ratio 2:3:4. The smallest angle is:

(A) 20° (B) 40° (C) 60° (D) 80°

23. Each day 10 people take 3 hours to move a pile of sand. If only 3 people turn up for work, the time taken to move the sand would be:

(A) 10 hours (B) 0.6 hours (C) 3.5 hours (D) 90 hours

24. Which of the cartons could hold at least 750mL?



(A) I only
(B) II only
(C) Both I and II
(D) Neither I or II

25. If $x + 2 = x + 3$ then:

(A) $x = 0$ (C) $x = \frac{2}{3}$

(B) there is no solution (D) x can be any number

26. The square root of nine less than twice the number T is written as :

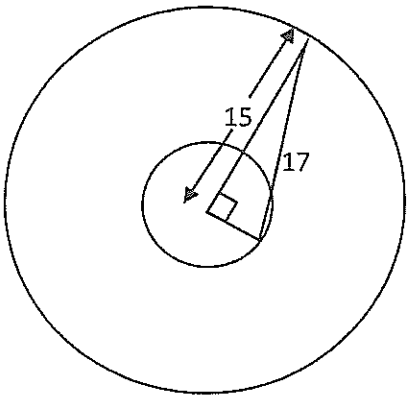
(A) $\sqrt{9-2T}$ (B) $9-\sqrt{2T}$ (C) $2\sqrt{T}-9$ (D) $\sqrt{2T-9}$

27. The solution of the equation $7(x+1)=3(2-x)$ is:

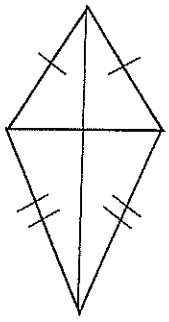
(A) $x=\frac{5}{8}$ (B) $x=\frac{-1}{4}$ (C) $x=\frac{-1}{8}$ (D) $x=\frac{-1}{10}$

28. The difference in the radii of the two circles with the same centre is:

(A) 8m
(B) 2m
(C) 7m
(D) 10m



29. The kite has an area of $48cm^2$. What are the possible lengths of the diagonals?



(A) 6cm and 4cm
(B) 6cm and 8cm
(C) 12cm and 8cm
(D) 16cm and 12cm

30. A and B are identical glasses. Glass A is full of juice and glass B is one third full. If half the contents of A are poured into B then the ratio of juice in A to juice in B is:

(A) 5:3 (B) 1:5 (C) 3:5 (D) 3:1

Section 2 – Write your answers in the space provided and on the separate answer sheet.

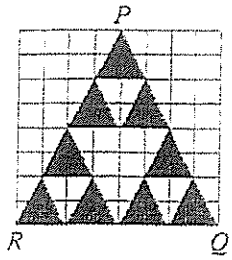
Question 31 (5 marks)

ANSWERS

a) A camera loses value at a rate of 20% p.a. A new camera is purchased for $600. What is its value two years after the purchase?

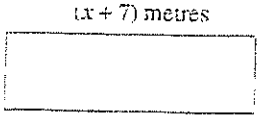
b) Evaluate $\frac{19.74-5.04}{\sqrt{4.41}}$

c)

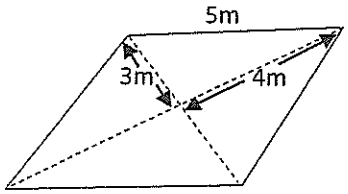


What fraction of triangle PQR is shaded ?

d) The perimeter of the rectangle is 60m. Find x.



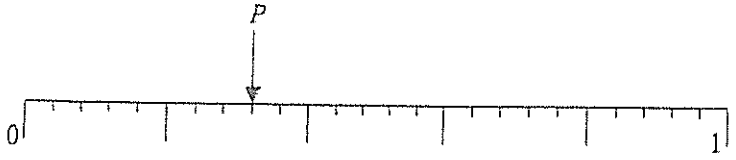
e) Find the area of this rhombus.



Question 32 (5 marks)

ANSWERS

a) Which decimal is represented at P?



b) The table shows the percentage composition of the audience at a circus.

Adults	*Children*	*Pensioners*
37%	55%	8%

If 56 pensioners attended, how many children attended?

c) Write the ratio 2L:80mL in simplest form.

d) Expand $-2x(5-x)$

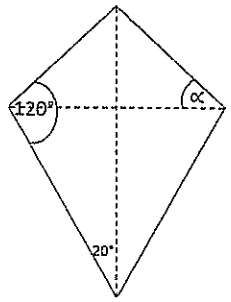
e) Simplify $\dfrac{-9x^4}{3x^0}$

Question 33 (5 marks) ANSWERS

a) A shopkeeper buys goods and calculates a marked price by adding a mark-up of 60%. If the cost of an item to the shopkeeper is $300, find the marked price.

b) Solve $\frac{x}{5} + 60 = 10$

c) Find the angle marked $\propto$ in this kite.



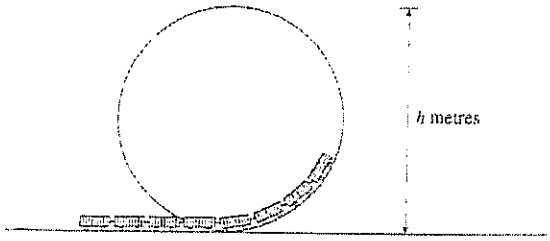
d) Evaluate $10 - 2x^2$ when $x = -1$

e) Simplify $(3ab^3)^4$

Question 34 (5 marks)

ANSWERS

a) For the "Big Looper" roller-coaster to complete a loop of the h metres safely, it must enter the loop with a speed of at least V metres/second, where $V^2 = 20h$



i. If h=12, find V correct to one decimal place. i.

ii. If V =18, find h. ii.

b) A class studied a local newspaper and decided that articles with a larger number of sentences contained more information.
Twenty five articles were randomly chosen. The number of sentences in each article chosen is shown in the stem and leaf plot below.

The General

0	567789
1	1346799
2	011234577
3	012

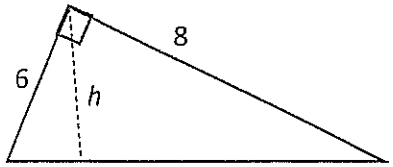
i. How many of the articles from 'The General' contained less than twenty sentences. i.

ii. Find the median length of the articles from 'The General'. ii.

c) The sum of 3 consecutive odd integers is 219. Find the first number.

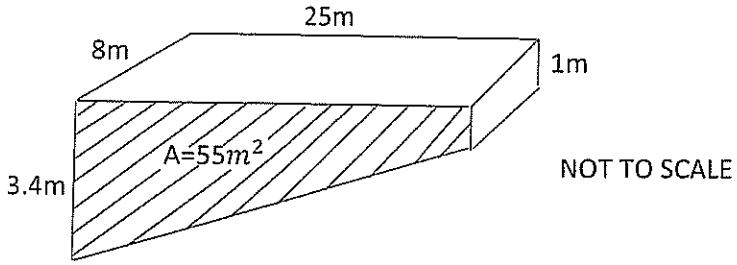
QUESTION 35 (5 marks) ANSWERS

a) Find h in this triangle.



b) Factorise fully $12a^3b^2 - 9a^2b$

c) Sydney Tech once had a pool in the shape of a trapezoidal prism with the approximate dimensions shown below:



NOT TO SCALE

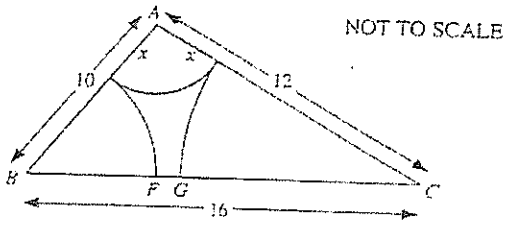
i. Find its volume in cubic metres

i.

ii. How many litres of water did it hold if filled to the top?

ii.

d) In triangle *ABC*, arcs of circles are drawn with centres *A, B, C* .
The radius of the arc with centre *A* is x.
Find an expression for the length of *FG* in terms of x.



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THE END

SYDNEY TECHNICAL HIGH SCHOOL

MULTIPLE CHOICE ANSWER SHEET

Name : .....

Teacher: .....

Course: Year 8 Yearly Part 1

Completely fill the response oval representing the most correct answer.

Do not remove this sheet from the answer booklet.

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 ○

PLEASE TURN OVER

31a) $384

b) 7

c) $\frac{9}{16}$

d) 11.5 m

e) $24\ m^2$

32a) 0.32

b) 385

c) 25 : 1

d) $2x^2 - 10x$

e) $-3x^4$

33a) $480

b) $x = -250$

c) $\alpha = 50^\circ$

d) 8

e) $81a^4b^{12}$

34a(i) 15.5

(ii) 16.2

b(i) 13

(ii) 19

c) 71

35a) $4\frac{4}{5} = 4.8$

b) $3a^2b(4ab - 3)$

c(i) $440\ m^3$

(ii) 440000 L

d) $2x - 6$