

BOARD OF STUDIES  
NEW SOUTH WALES

# 2005 SCHOOL CERTIFICATE TEST

## Mathematics

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Centre Number

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Student Number

### Section 1 Pages 1–8

25 marks

You have 30 minutes for this section

Answer Questions 1–25 in the spaces provided

Calculators are NOT to be used in this section

There will be a short break between Section 1 and Section 2

**Section 1**

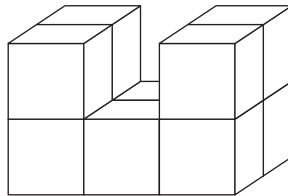
25 marks

Answer Questions 1–25 in the spaces provided.

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1 This solid is constructed using identical cubes.

The volume of the solid is  $60 \text{ cm}^3$ .



What is the volume of each cube?

.....  
 .....

2 A can of drink costs 80 cents.

How many cans of drink can be bought for \$3.20?

.....  
 .....

3  $5 \div \frac{1}{3} =$

.....  
 .....

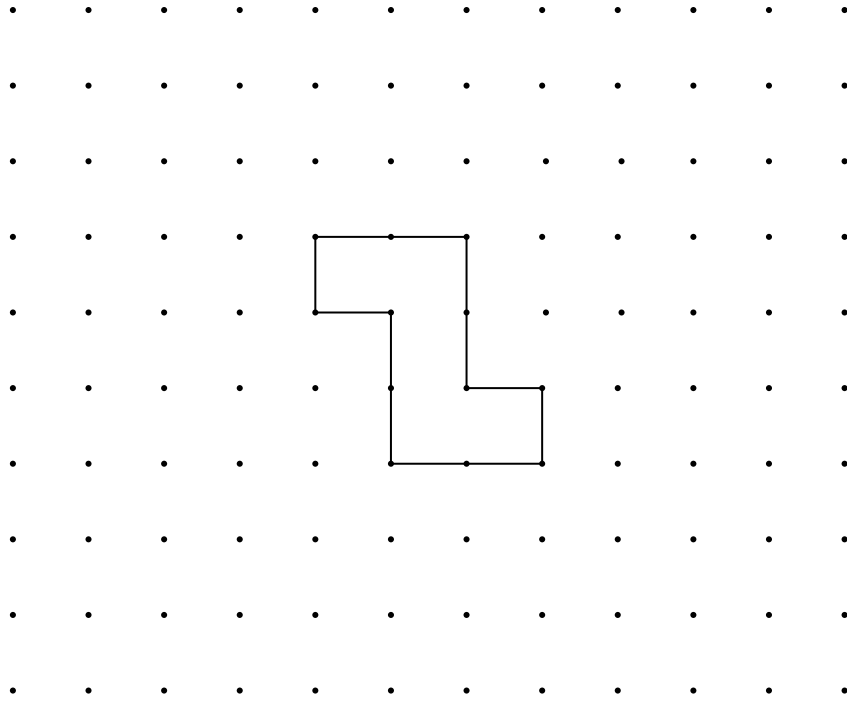
4  $42 \times 8 = 336$ .

What is the value of  $0.42 \times 8$ ?

.....

- 5 The shape below is to be translated 3 centimetres to the right and 2 centimetres down.

Draw this shape in its new position.



- 6 Luis had 40 footy cards. He lost  $\frac{1}{4}$  of them and sold 50% of the remaining cards. How many cards did Luis have left?

.....

.....

.....

- 7 The time on a digital clock appears as



How many minutes are there until 4 pm on the same day?

.....

.....

.....

8 A circle has a radius of 7 cm.

Estimate the area of the circle.

.....

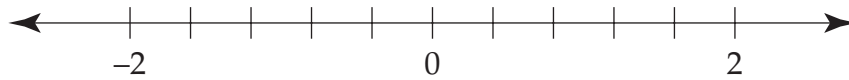
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9 Add  $\frac{7}{100}$  to 5.934.

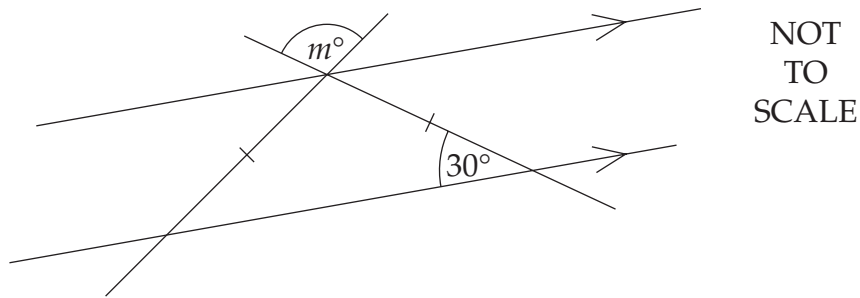
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10 Mark the position of  $-1.6$  with a cross (X) on this number line.



11 What is the value of  $m$  in the diagram?



.....

.....

.....

12 Complete the table below, using the rule  $A = n(n - 1)$ .

$n$	2	4	6
$A$	2	12	

- 13 Ahmed is constructing a right-angled triangle.

$AB$  is a side of the triangle.

The right angle is at  $B$ .

The length of the hypotenuse is 6 cm.

Complete the triangle.



- 14 The expression  $\frac{84}{\square + 3}$  has a value between 8 and 10.

What is a possible value of  $\square$ ?

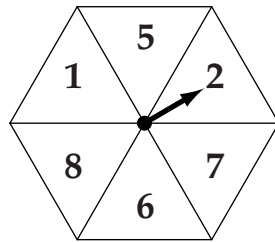
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- 15 What number is half-way between  $\frac{2}{5}$  and 0.7?

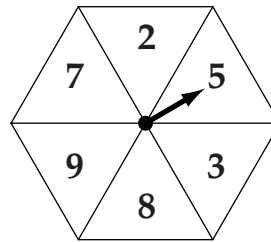
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16 Ted makes the statement:

‘Spinners A and B are equally likely to stop on an odd number.’



Spinner A



Spinner B

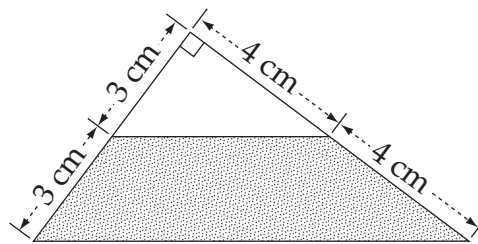
Explain briefly why Ted’s statement is incorrect.

.....

.....

.....

17 Calculate the area of the shaded region in the diagram.



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TO  
SCALE

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18 A score was added to the set of scores below.

3 6 9 9 9 10

The new mean is equal to 7.

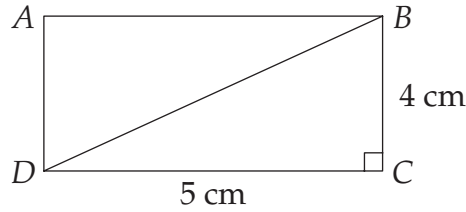
What score was added?

.....

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- 19 A rectangle  $ABCD$  has dimensions 4 cm by 5 cm.



NOT  
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SCALE

Between which two consecutive integers does the length of the diagonal lie?

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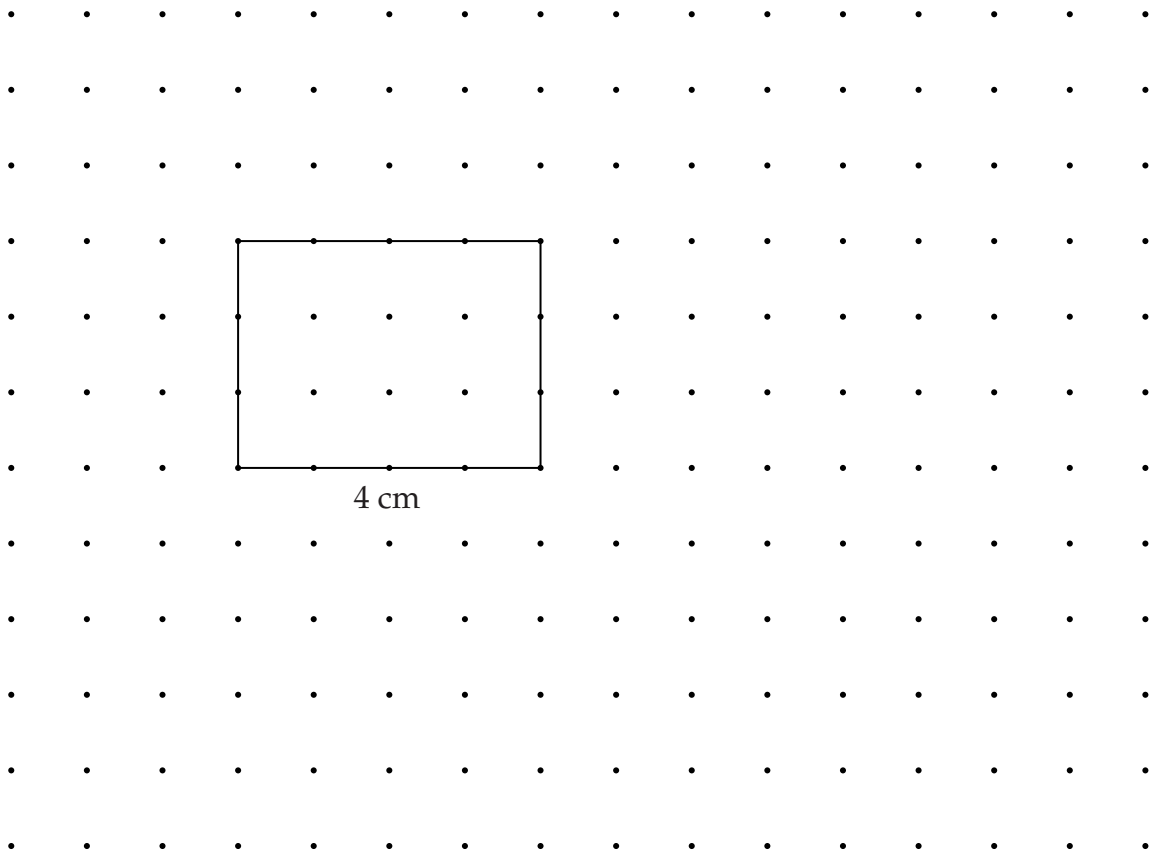
- 20 The ratio of boys to girls in a Mathematics class is 4:5. The number of girls increases from 15 to 18.

What is the new ratio of boys to girls?

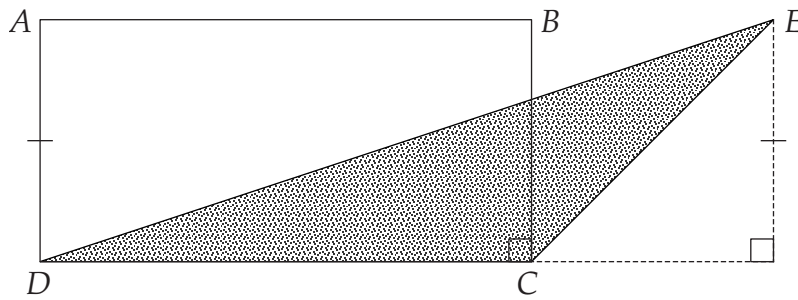
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- 21 A rectangular prism has a volume of  $24 \text{ cm}^3$ . The diagram shows part of the net of this rectangular prism.

Complete this net.



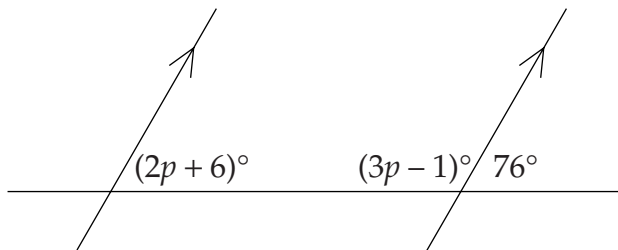
- 22 What is the ratio of the area of triangle  $DEC$  to the area of rectangle  $ABCD$ ?



.....

.....

- 23 Using the diagram below, write an equation that could be used to find the value of  $p$ .



.....

.....

- 24 Pina and Sandra are playing each other in a game of tennis. Sandra is three times more likely to win than Pina.

What is the probability that Pina will win the game?

.....

.....

- 25 Consider the pattern.

$$10^2 - 10 + 1 = 91$$

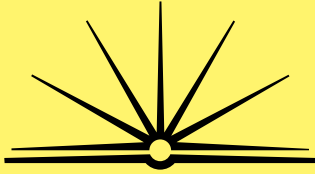
$$10^4 - 10^2 + 1 = 9901$$

$$10^6 - 10^3 + 1 = 999\,001$$

Use this pattern to complete:

$$10^{10} - 10^{\boxed{\phantom{00}}} + 1 = \boxed{\phantom{0000000000}}$$

**End of Section 1**



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**2005  
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**Mathematics**

**Section 2** Pages 9–35

**75 marks**

You have 1 hour and 30 minutes for this section

This section has TWO parts

Part A – 50 marks      Questions 26–75

Part B – 25 marks      Questions 76–84

Calculators may be used in this section

Do not commence Section 2 until you are instructed to do so



- 26 Enrico spent yesterday in Thredbo. The temperature at 6 am was  $-3^{\circ}\text{C}$ . Between 6 am and 6 pm the temperature rose by  $7^{\circ}\text{C}$  and then fell by  $10^{\circ}\text{C}$ .

What was the temperature at 6 pm?

- (A)  $-20^{\circ}\text{C}$       (B)  $-6^{\circ}\text{C}$       (C)  $0^{\circ}\text{C}$       (D)  $14^{\circ}\text{C}$

- 27 Mario is a plumber. He is paid \$36 per hour for the first eight hours worked each day, and time-and-a-half for each additional hour.

Calculate Mario's pay when he works a ten-hour day.

- (A) \$288      (B) \$360      (C) \$396      (D) \$540

- 28 What is the median of the numbers 0, 2, 4, 6, 6, 7?

- (A) 4      (B) 5      (C) 6      (D) 7

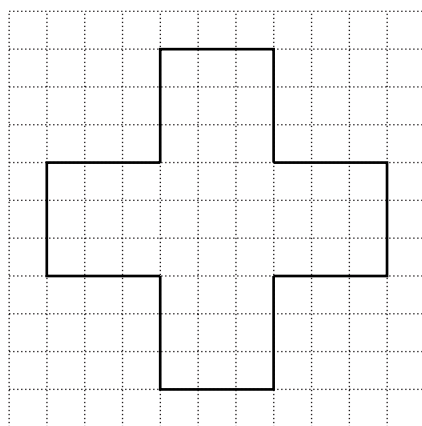
- 29 Jenny hired a taxi to travel home from work. The distance from her work to home is 21 kilometres. A hiring fee of \$2.75 was charged, plus \$1.56 per kilometre travelled.

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

- 30 How many axes of symmetry does this shape have?



- (A) 1      (B) 2      (C) 3      (D) 4

31 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.

32 A coin is tossed, and a standard die is rolled.

The possible outcomes are:

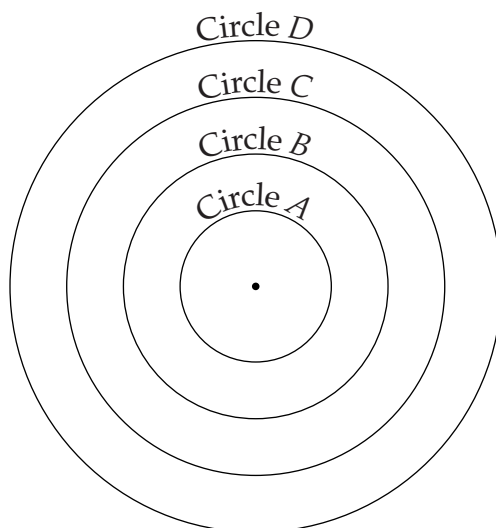
<i>H1</i>	<i>H2</i>	<i>H3</i>	<i>H4</i>	<i>H5</i>	<i>H6</i>	<i>H = head</i>
<i>T1</i>	<i>T2</i>	<i>T3</i>	<i>T4</i>	<i>T5</i>	<i>T6</i>	<i>T = tail</i>

What is the probability of obtaining a head and a number less than 5?

- (A)  $\frac{1}{12}$
- (B)  $\frac{1}{3}$
- (C)  $\frac{5}{12}$
- (D)  $\frac{5}{6}$

33 A game uses the target drawn below.

The target consists of four concentric circles.

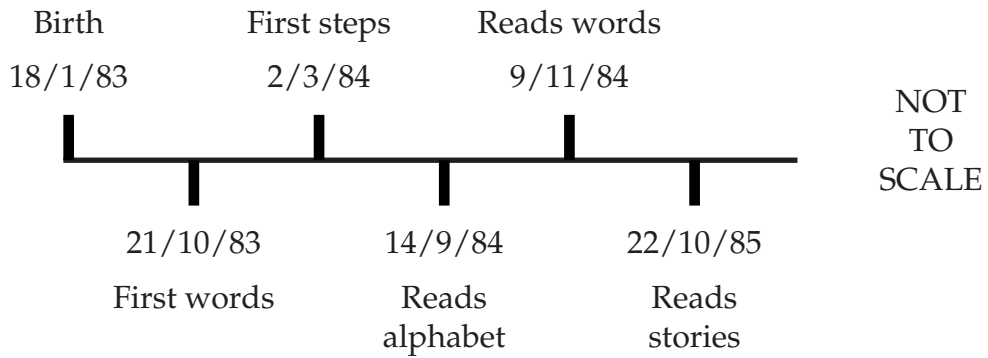


Which circle has a circumference closest to 11 cm?

- (A) Circle A
- (B) Circle B
- (C) Circle C
- (D) Circle D

34

**Recorded stages of Erica's development**



Which stage of Erica's development was the longest?

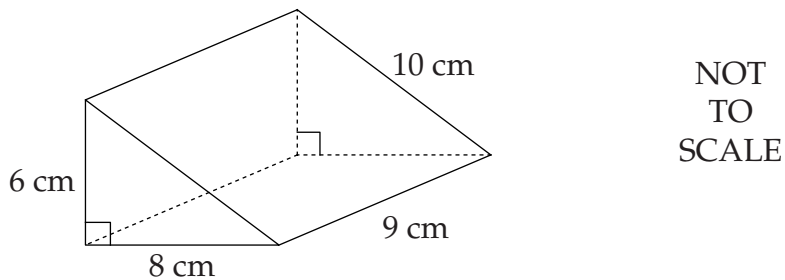
- (A) From birth to first words
- (B) From first words to first steps
- (C) From reads alphabet to reads words
- (D) From reads words to reads stories

35 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?

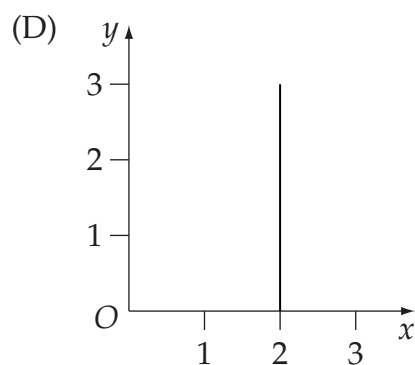
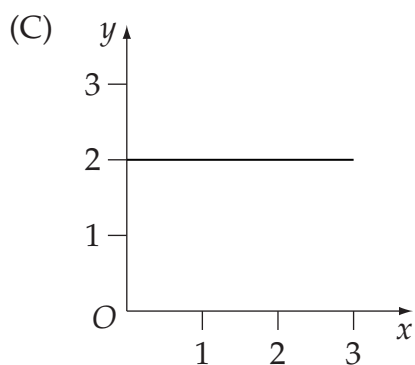
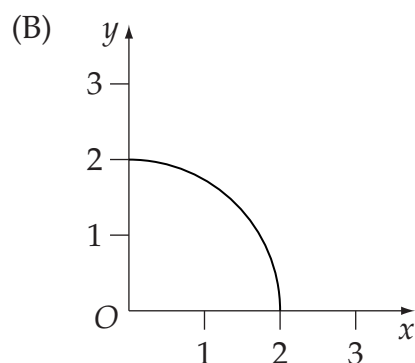
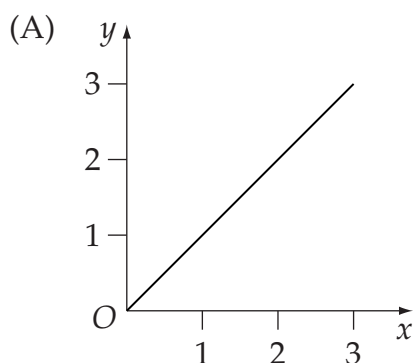
- (A) 5th
- (B) 6th
- (C) 7th
- (D) 8th

36 What is the volume of this prism?



- (A)  $216 \text{ cm}^3$
- (B)  $240 \text{ cm}^3$
- (C)  $432 \text{ cm}^3$
- (D)  $480 \text{ cm}^3$

37 Which graph represents the rule 'x is equal to 2'?



Use the following information to answer Questions 38 and 39.

The stem-and-leaf plot shows the heights, in centimetres, of Year 10 girls at Inspiration High School.

14	9 9
15	1 2 2 3 5 5 6 7 9
16	0 6 8 8 8
17	0 2 2 6
18	0

38 What is the range of these heights?

- (A) 4 cm                      (B) 9 cm                      (C) 27 cm                      (D) 31 cm

39 What is the median height?

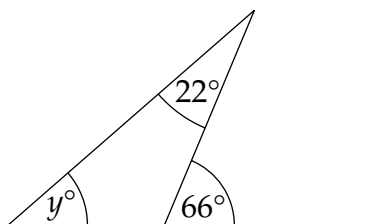
- (A) 151 cm                      (B) 159 cm                      (C) 160 cm                      (D) 168 cm

- 40 Which of the following is a part of the circumference of a circle?
- (A) Arc                      (B) Diameter              (C) Radius                  (D) Sector
- 

- 41 Which of the following always has a probability of  $\frac{1}{3}$ ?
- (A) A traffic light being red  
(B) A woman's third child being a boy  
(C) Rolling a number less than 3 on a standard die  
(D) Choosing a red bead from a bag containing 3 red and 9 blue beads
- 

- 42 Simplify  $3(k-1) - 2(k-5)$ .
- (A)  $k+7$                   (B)  $k+4$                   (C)  $k-6$                   (D)  $k-13$
- 

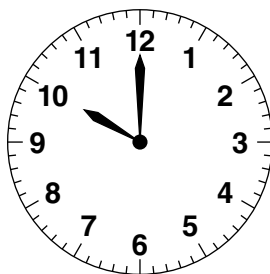
- 43 What is the value of  $y$ ?



NOT  
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- (A) 22                      (B) 44                      (C) 66                      (D) 88
- 

- 44 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
-

Use the following information to answer Questions 45–47.

Sharyn surveyed her class to find the number of children in each family. She recorded the data in this table.

Score $x$	Frequency $f$
1	3
2	5
3	4
4	2
5	2
6	1
7	1

45 What is the mode?

- (A) 2                      (B) 3                      (C) 4                      (D) 5

46 What is the total number of children in all the families?

- (A) 7                      (B) 18                      (C) 28                      (D) 56

47 Which of the following expressions would give the mean of the data?

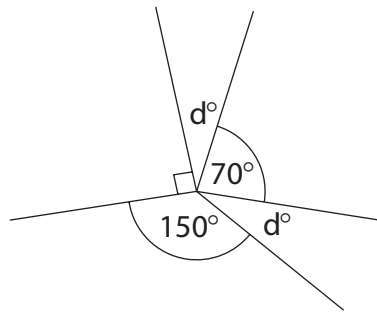
(A)  $\frac{1 + 2 + 3 + 4 + 5 + 6 + 7}{7}$

(B)  $\frac{1 + 2 + 3 + 4 + 5 + 6 + 7}{18}$

(C)  $\frac{(1 \times 3) + (2 \times 5) + (3 \times 4) + (4 \times 2) + (5 \times 2) + (6 \times 1) + (7 \times 1)}{7}$

(D)  $\frac{(1 \times 3) + (2 \times 5) + (3 \times 4) + (4 \times 2) + (5 \times 2) + (6 \times 1) + (7 \times 1)}{18}$

48

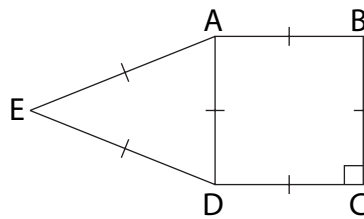


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What is the value of  $d$ ?

- (A) 25                      (B) 35                      (C) 50                      (D) 70

49

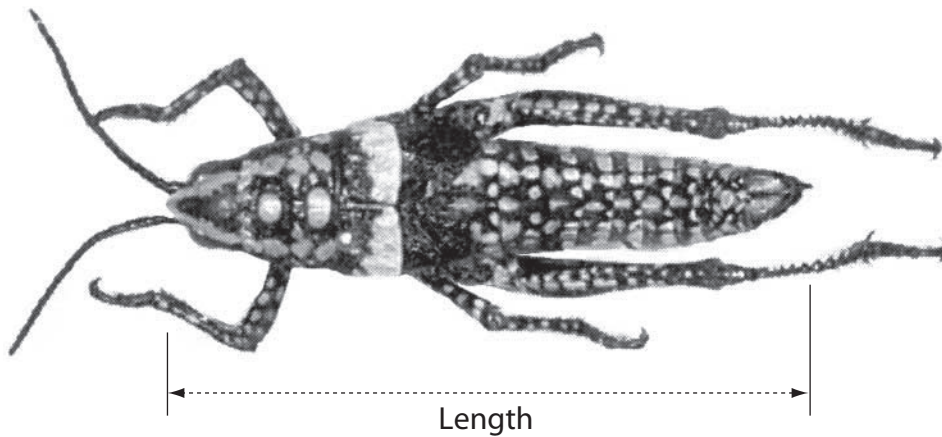


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What is the size of  $\angle EDC$  ?

- (A)  $60^\circ$                       (B)  $90^\circ$                       (C)  $150^\circ$                       (D)  $180^\circ$

50 The picture shows an insect.



SCALE  
3:1

CSIRO Entomology

Which of the following is closest to the actual length of the insect?

- (A) 2.1 cm                      (B) 2.8 cm                      (C) 8.5 cm                      (D) 25.5 cm

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

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

52 Oliver is drawing a sector graph. It will show how the 25 students in his class travel to school. Five of these students walk to school.

What angle should Oliver use for the sector that represents the students who walk to school?

- (A)  $5^\circ$                       (B)  $20^\circ$                       (C)  $25^\circ$                       (D)  $72^\circ$
- 

53 A person is chosen at random.

What is the probability that the person was NOT born on a Monday?

- (A)  $\frac{1}{5}$                       (B)  $\frac{4}{5}$                       (C)  $\frac{1}{7}$                       (D)  $\frac{6}{7}$
- 

54 Vanessa is comparing mobile phone charges.

Which of the following is the best value for a ten-minute phone call?

- (A) 1.5 cents per second  
(B) 50 cents per 30 seconds  
(C) A fifty-cent connection fee plus 40 cents per 30 seconds  
(D) \$3 for the first 5 minutes plus 57 cents per 30 seconds thereafter
- 

55 Solve  $\frac{n-8}{4} = 7$ .

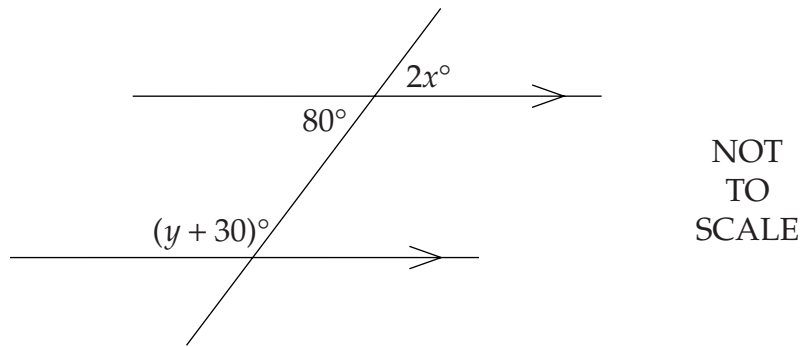
- (A)  $n = 9$                       (B)  $n = 20$                       (C)  $n = 36$                       (D)  $n = 60$
- 

56 Sarah and Jane receive 45 text messages in the ratio 5 : 4.

How many text messages does Jane receive?

- (A) 5                      (B) 20                      (C) 25                      (D) 36
-

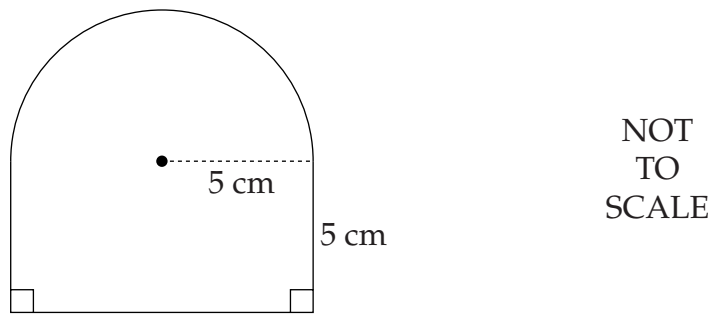
57



What are the values of  $x$  and  $y$ ?

- (A)  $x = 40, y = 50$                       (B)  $x = 40, y = 70$   
 (C)  $x = 80, y = 50$                       (D)  $x = 80, y = 70$

58 Which of the following is the perimeter, in centimetres, of this shape?



- (A)  $5\pi + 20$               (B)  $5\pi + 30$               (C)  $10\pi + 20$               (D)  $10\pi + 30$

59 Brad goes to a shop that sells five flavours of ice-cream. Each flavour comes in a separate tub. He decides to buy two tubs, each one containing a different flavour.

How many choices are possible?

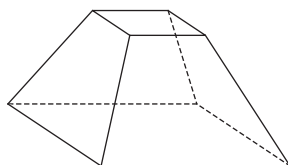
- (A) 5                      (B) 9                      (C) 10                      (D) 20

60 Emma is comparing simple interest rates.

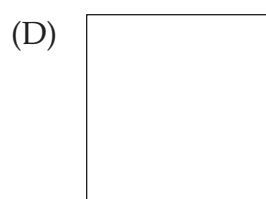
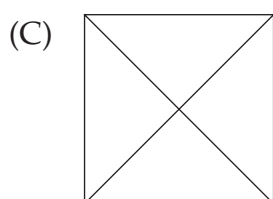
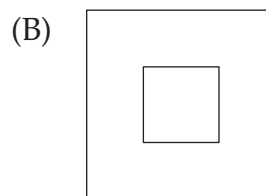
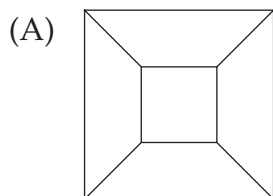
Which of the following is the lowest simple interest rate?

- (A) 0.05% per day                      (B) 0.35% per week  
 (C) 1.6% per month                      (D) 18.1% per year

61



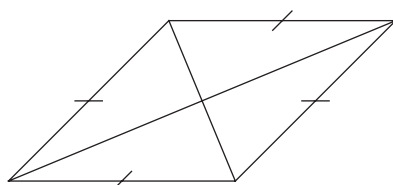
Which of the following shows the top view of the shape drawn above?



62 How many milligrams are there in 20 kilograms?

- (A) 0.02                      (B) 20 000                      (C) 2 000 000                      (D) 20 000 000

63 A rhombus has an area of  $24 \text{ cm}^2$ .

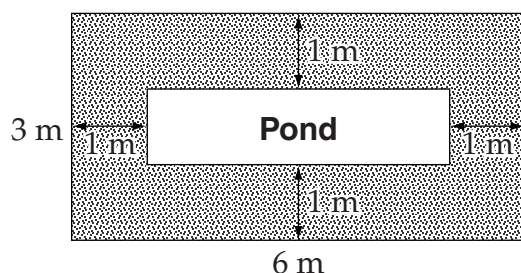


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What are possible lengths of the diagonals of the rhombus?

- (A) 3 cm and 4 cm                      (B) 4 cm and 6 cm  
(C) 4 cm and 12 cm                      (D) 8 cm and 12 cm

- 64 A rectangular pond is surrounded by a path one metre wide, as shown.



What is the area of the path, in square metres?

- (A) 4                      (B) 8                      (C) 10                      (D) 14
- 
- 65 George bought a new digital television. After receiving a 20% discount, he paid \$2000.

What was the original price?

- (A) \$1600                      (B) \$2020                      (C) \$2400                      (D) \$2500
- 

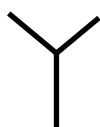
- 66 The following four diagrams represent fractal trees.

1st tree



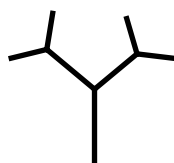
1 branch

2nd tree



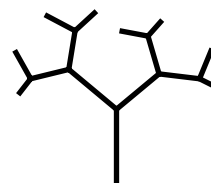
3 branches

3rd tree



7 branches

4th tree



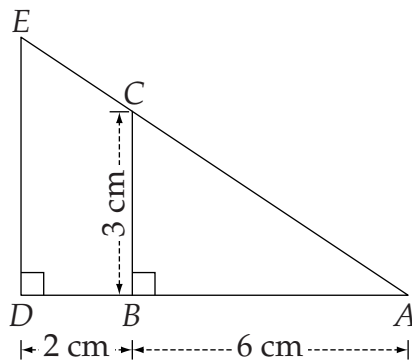
15 branches

How many branches would be in the seventh fractal tree?

- (A) 63                      (B) 64                      (C) 127                      (D) 128
-



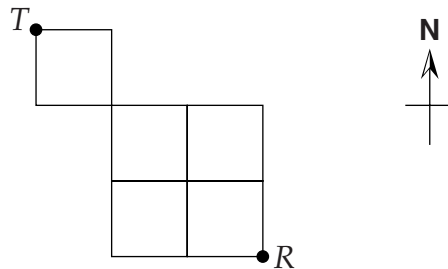
- 70  $\triangle ABC$  is similar to  $\triangle ADE$ .  
 $AB = 6$  cm,  $BC = 3$  cm and  $DB = 2$  cm.



What is the length of  $ED$ ?

- (A) 4 cm                      (B) 6 cm                      (C) 8 cm                      (D) 9 cm

- 71 In the diagram below, the lines represent the streets linking Tamar's house ( $T$ ) to Rod's house ( $R$ ).

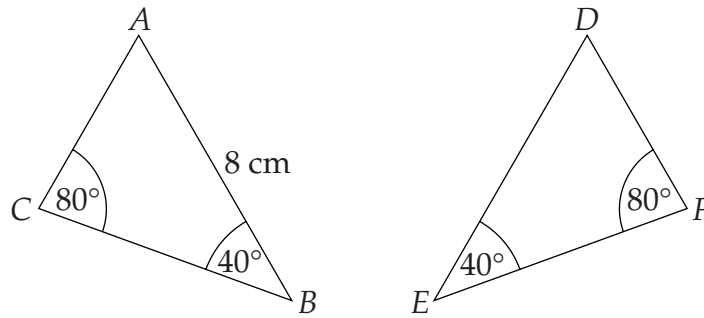


Tamar can only travel in an easterly or southerly direction.

In how many ways can Tamar travel to Rod's house?

- (A) 4                              (B) 8                              (C) 10                              (D) 12

72

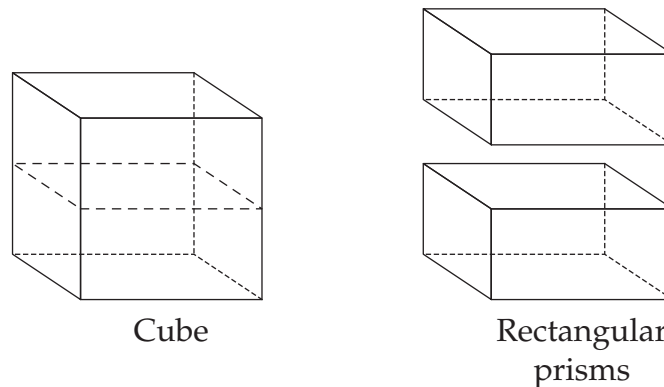


NOT  
TO  
SCALE

What additional information is necessary to prove that  $\triangle ABC$  is congruent to  $\triangle DEF$ ?

- (A)  $\angle EDF = 60^\circ$     (B)  $DE = 8 \text{ cm}$     (C)  $DF = 8 \text{ cm}$     (D)  $EF = 8 \text{ cm}$

73 A cube is cut into two rectangular prisms, as shown. The surface area has now increased.



By what fraction has the surface area increased?

- (A)  $\frac{1}{12}$     (B)  $\frac{1}{6}$     (C)  $\frac{1}{3}$     (D)  $\frac{1}{2}$

74 Two years ago, Isabella's age was three times her brother's age. Her brother is now  $x$  years old.

How old is Isabella now?

- (A)  $3x$     (B)  $3x - 4$     (C)  $3x - 6$     (D)  $3x + 2$

75  $a$ ,  $b$  and  $c$  are three different positive integers, and  $(ab)^2 = abc$ .

Which of the following is a possible value for  $c$ ?

- (A) 1    (B) 5    (C) 9    (D) 12

## Section 2 (continued)

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## PART B

Centre Number

## Instructions for Questions 76–80

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Student Number

Questions 76–80 are worth 1 mark each.

For Questions 76–80, fill in the response oval(s) corresponding to the correct answer(s). Each question may have one, two, three or four correct answers.

**Sample:**  $\frac{2}{3} =$  (A)  $\frac{2-1}{3-1}$  (B)  $\frac{2+1}{3+1}$  (C)  $\frac{2 \times 1}{3 \times 1}$  (D)  $\frac{2 \div 1}{3 \div 1}$

A  B  C  D

In the sample question, three ovals have been filled in to show the correct answer(s) to be (B), (C) and (D).

If you think you have made a mistake, put a cross through the incorrect answer. If you change your mind and have crossed out what you consider to be a correct answer, indicate this by writing the word **correct** and drawing an arrow, as shown below.

A  B  C  D

This sample indicates that (C) and (D) are the correct answers.

For Questions 76–80, fill in the response oval(s) corresponding to the correct answer(s). Each question may have one, two, three or four correct answers.

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- 76 A shop bought an MP3 player for \$60 and sold it for \$80.

Which of the following statements must be true?

- (A) The profit was 20% of the selling price.  
(B) The profit was 25% of the cost price.  
(C) The cost price was 25% less than the selling price.  
(D) The selling price was  $33\frac{1}{3}\%$  more than the cost price.

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

---

- 77 Triangle  $PQR$  has the following properties:

- one angle is  $30^\circ$
- two of the angles are equal.

What type of triangle could  $\Delta PQR$  be?

- (A) Acute-angled  
(B) Isosceles  
(C) Obtuse-angled  
(D) Right-angled

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

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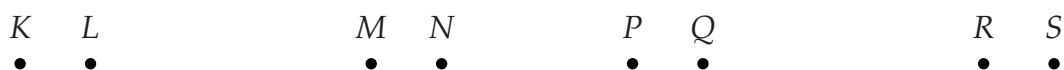
- 78 If  $p > 0$  and  $q > 0$ , which of the following must always be true?

- (A)  $p - q > 0$   
(B)  $p + q > 0$   
(C)  $pq > 0$   
(D)  $\frac{p}{q} > 0$

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

---

- 79  $XY$  is one side of a parallelogram. One of the angles in the parallelogram is  $65^\circ$ .



Which of the following could be the side opposite  $XY$ ?

- (A)  $KP$   
 (B)  $LQ$   
 (C)  $MR$   
 (D)  $NS$

- (A)       (B)       (C)       (D)

- 80 A bag contains red, black and yellow marbles. There are more red than black marbles, and there are more black than yellow marbles.

There are 3 yellow marbles and 10 red marbles. Chris draws a marble at random.

Which of the following statements could be true?

- (A) The probability of drawing a yellow marble is  $\frac{3}{17}$ .  
 (B) The probability of drawing a black marble is  $\frac{7}{21}$ .  
 (C) The probability of drawing a red marble is  $\frac{10}{22}$ .  
 (D) The probability of drawing a red marble is  $\frac{10}{23}$ .

- (A)       (B)       (C)       (D)

## Section 2 – Part B (continued)

## Questions 81–84

Answer the questions in the spaces provided.

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Marks

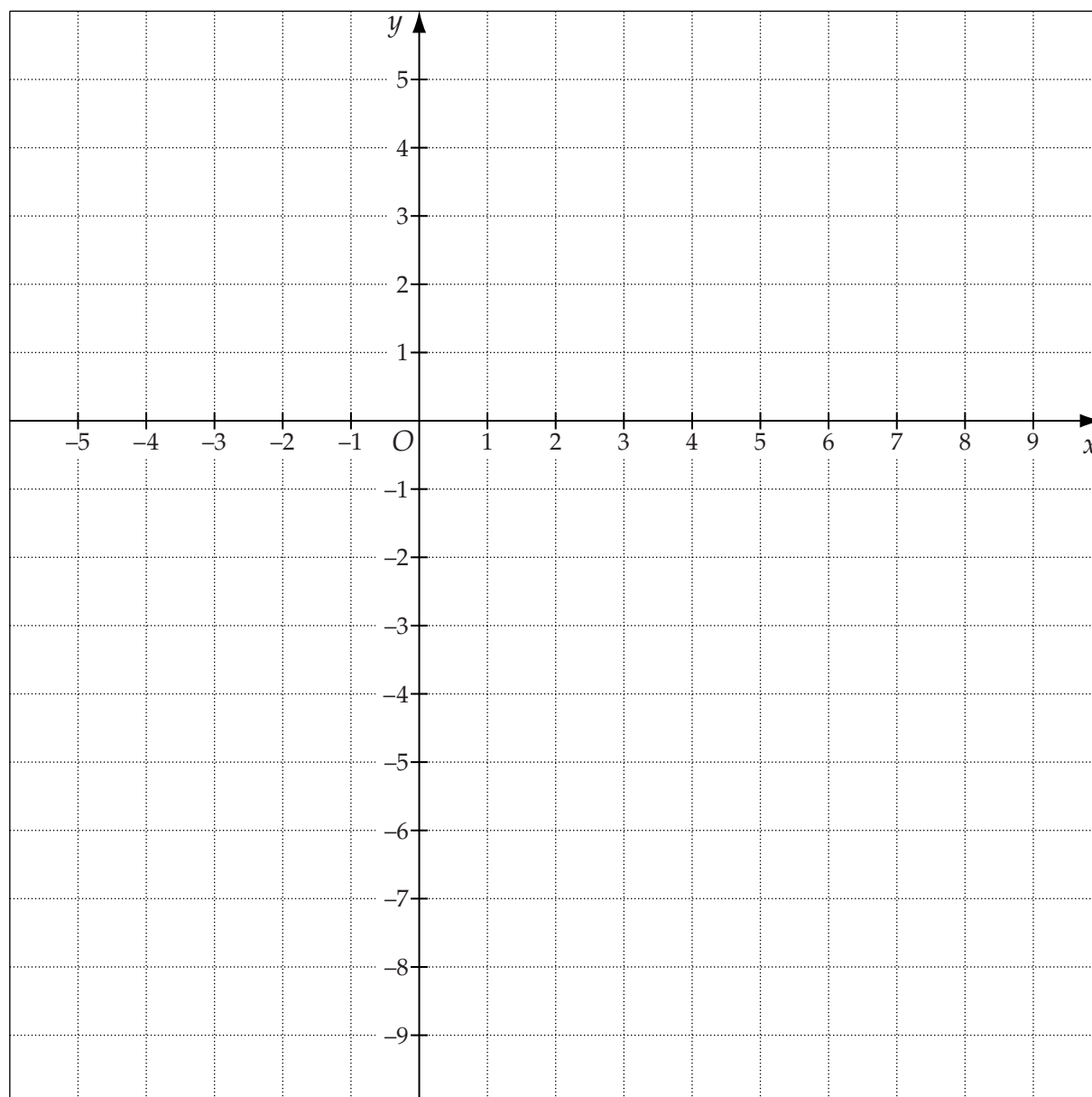
## Question 81 (5 marks)

- (a) On the number plane below, plot the points

1

$$A(-5, 3), B(1, -3) \text{ and } C(6, -4)$$

and join them to form  $\triangle ABC$ .



Question 81 continues on page 29

	<b>Marks</b>
Question 81 (continued)	
(b) Measure the length of $AB$ in centimetres, correct to one decimal place. .....	<b>1</b>
(c) By measurement and calculation, find the area of $\triangle ABC$ to the nearest square centimetre. ..... ..... ..... .....	<b>2</b>
(d) On the number plane, plot a point $D$ so that the area of $\triangle ABD$ is twice the area of $\triangle ABC$ .	<b>1</b>

**End of Question 81**

**Please turn over**

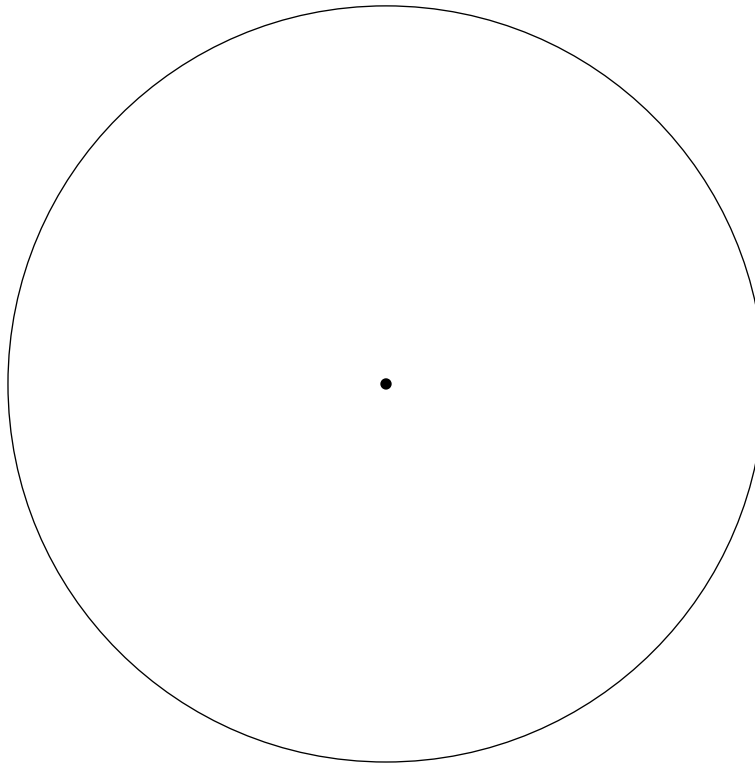
Marks

**Question 82** (5 marks)

A prize wheel is made from a circle divided into six equal sectors.

- (a) Barbara commenced a drawing of the prize wheel. 1

Complete the drawing by constructing the six equal sectors.



- (b) Each time the wheel is spun it stops on one sector, resulting in one of the following prizes: 1

\$0, \$5, \$10, \$20, \$30, \$60.

On the first spin, \$5 is won.

What is the probability that \$5 is won on the second spin?

.....  
 .....

**Question 82 continues on page 31**

Marks

Question 82 (continued)

- (c) The wheel was spun a total of 50 times. The results were recorded in the table.

<i>Prize</i>	<i>Frequency</i>	<i>Relative frequency</i>
\$0	8	0.16
\$5	<input type="text"/>	0.14
\$10	9	<input type="text"/>
\$20	10	0.20
\$30	8	0.16
\$60	8	0.16
	50	1

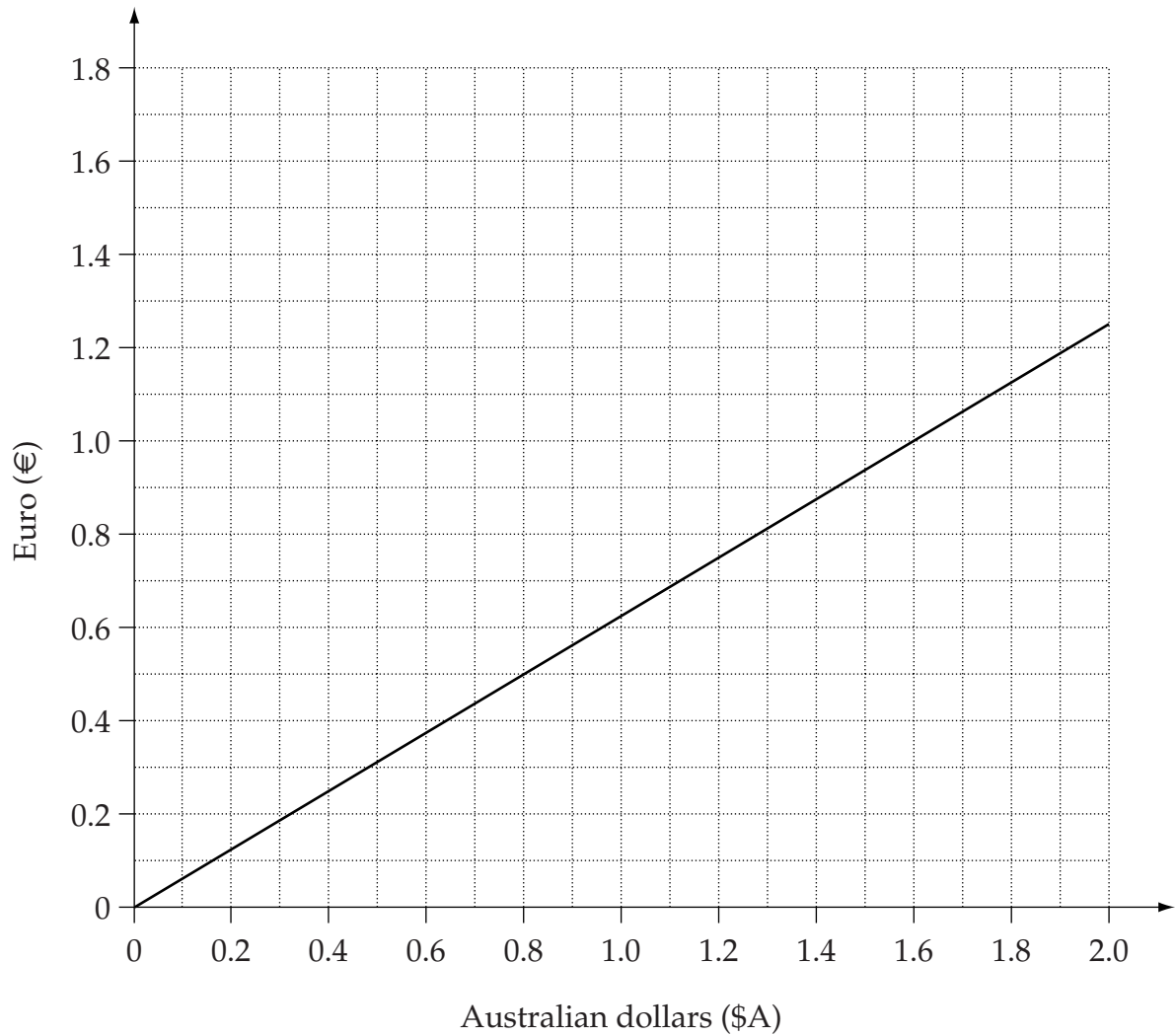
- (i) Complete the table by writing a value in each of the two boxes. 2
- (ii) How much prize money was won? 1

.....  
.....

**End of Question 82**

**Question 83** (5 marks)

Scott used this graph to convert between Australian dollars (\$A) and Euro (€).



**Question 83 continues on page 33**

Marks

Question 83 (continued)

(a) Use the graph to complete: €1 = \$A . 1

(b) Scott travelled to Europe with his wife. If he had booked and paid for a hotel room while still in Australia it would have cost him \$A96 per person per night. 2

He paid for the room when he arrived in Europe and it cost him a total of €105 per night.

How much, in \$A, did Scott save per night by paying for the room when he arrived in Europe?

.....

.....

.....

.....

(c) The following year, Dominic travelled to Europe. He converted \$A200 to €110.

(i) What was the exchange rate? 1

.....

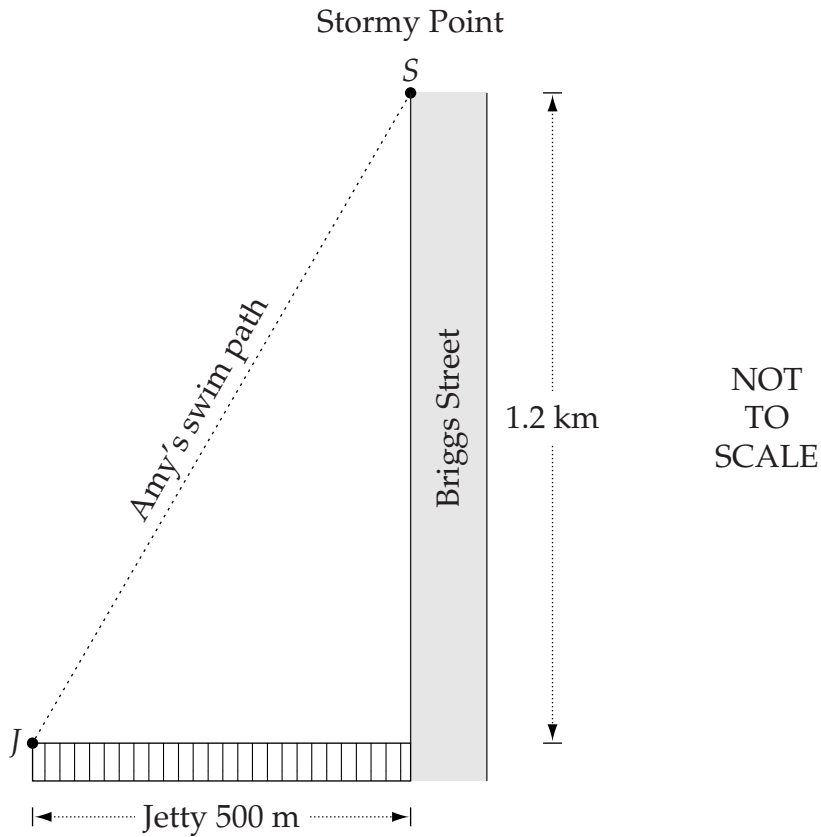
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(ii) On the graph on page 32, draw a line that represents this exchange rate. 1

**End of Question 83**

Marks

Question 84 (5 marks)



Amy swims each morning from Stormy Point (*S*) to the end of the jetty (*J*). She leaves at 6 am and it takes her 20 minutes to complete the swim.

- (a) Show that the distance that Amy swims from Stormy Point to the end of the jetty is 1.3 km. 1

.....

.....

.....

- (b) Calculate Amy's average speed for the swim, in kilometres per hour. 1

.....

.....

.....

Question 84 continues on page 35

Marks

Question 84 (continued)

- (c) Erin jogs from Stormy Point along Briggs Street, and then to the end of the jetty, at an average speed of 6.8 km/h. 2

At what time should Erin leave Stormy Point if she wants to arrive at the end of the jetty at the same time as Amy?

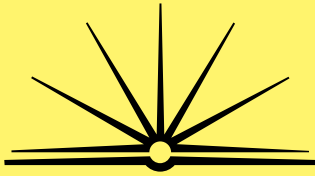
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- (d) Convert Erin's average speed of 6.8 km/h to metres per second. Give your answer correct to two decimal places. 1

.....  
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**End of test**

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BOARD OF STUDIES  
NEW SOUTH WALES

## 2005 SCHOOL CERTIFICATE TEST

### General Test Instructions

- Total marks: 100
- Reading time: 5 minutes
- Working time: 2 hours
- There will be a short break between Section 1 and Section 2
- Write using black or blue pen
- You may use a pencil to draw or complete diagrams
- Attempt ALL questions
- Calculators may be used in Section 2 only
- A formulae sheet is provided on the back of this page
- Write your Centre Number and Student Number at the top of page 1 (Section 1) and page 25 (Section 2 Part B)

## Mathematics

### Section 1 Pages 1–8

**25 marks**

You have 30 minutes for this section

Questions 1–25

Calculators are NOT to be used in this section

### Section 2 Pages 9–35

**75 marks**

You have 1 hour and 30 minutes for this section

This section has TWO parts

Part A – 50 marks      Questions 26–75

Part B – 25 marks      Questions 76–84

Calculators may be used in both parts of this section

# FORMULAE

For use in both SECTION 1 and SECTION 2

Circumference of a circle =  $\pi \times$  diameter

$$[C = \pi d]$$

Area of a circle =  $\pi \times$  radius squared

$$[A = \pi r^2]$$

Area of a parallelogram = base  $\times$  perpendicular height

$$[A = bh]$$

Area of a rhombus = half the product of the diagonals

$$\left[ A = \frac{1}{2}xy \right]$$

Area of a trapezium = half the sum of the parallel sides  $\times$  perpendicular height

$$\left[ A = \left( \frac{a+b}{2} \right) h \right]$$

Volume of a prism = area of cross-section  $\times$  height

$$[V = Ah]$$

Volume of a cylinder =  $\pi \times$  radius squared  $\times$  height

$$[V = \pi r^2 h]$$

Pythagoras' theorem states:

*In a right-angled triangle,*

*the hypotenuse squared = the sum of the squares of the other two sides*

$$[c^2 = a^2 + b^2]$$