BOARD OF STUDIES
NEW SOUTH WALES

1999 SCHOOL CERTIFICATE TEST

9 November
Start 9.25 am

MATHEMATICS

SECTION 1

General Test Instructions

- Preparation time: 5 minutes
- Working time: 2 hours
- The supervisor will tell you when to begin the test
- This test has TWO sections
- Attempt ALL questions
- There will be a short break between Section 1 and Section 2
- Calculators may be used in Section 2 only
- The Sample Questions & Formulae Booklet may be used in both sections.

Directions for Section 1

1 You have 30 minutes to answer Section 1

2 Section 1 Questions 1–25 (25 marks)

3 Calculators are NOT to be used in Section 1

4
- Complete your answers to Questions 1–12 on Section 1—Answer Sheet 1
- Complete your answers to Questions 13–25 on Section 1—Answer Sheet 2

Complete your answers to Questions 1–12 on Section 1—Answer Sheet 1.

1 $2 \times 5 + 7 \times 10 =$

(A) 80 (B) 150 (C) 170 (D) 700

---

2 Write 57 263 to the nearest hundred.

(A) 57 000 (B) 57 200 (C) 57 260 (D) 57 300

---

3 $\frac{5}{100} + \frac{3}{10} =$

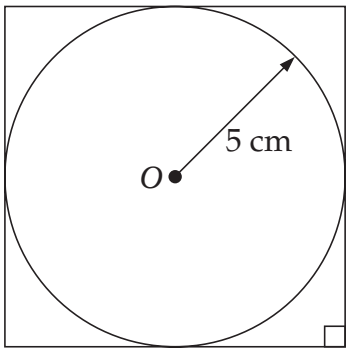
(A) 0.305 (B) 0.35 (C) 0.503 (D) 0.53

---

4 102 multiplied by 395 is about

(A) 4000 (B) 40 000 (C) 400 000 (D) 4 000 000

5



A circle with radius 5 cm is drawn in a square as shown.

The area of the square is

(A) 20 cm^2

(B) 25 cm^2

(C) 40 cm^2

(D) 100 cm^2

---

6 Which decimal is closest to 5.17?

(A) 5.16 (B) 5.175 (C) 5.18 (D) 5.2

---

7 Tran caught 30 fish but 2 out of every 3 were too small to take home.

How many fish were too small to take home?

(A) 10 (B) 12 (C) 18 (D) 20

---

8 Sylvia starts watching a video at 7:55 pm.
The video runs for 135 minutes.

At what time will the video finish?

(A) 9:10 pm (B) 9:30 pm (C) 10:10 pm (D) 10:20 pm

---

9 The fraction $\frac{1}{3}$ is

(A) less than $\frac{3}{10}$ (B) greater than $\frac{7}{20}$

(C) equal to $0.\dot{3}$ (D) equal to 33%

---

10 John is asked to find 24% of \$8.96.
He enters into his calculator $24 \div 100 \times 896$ and the display is 215.04.

The answer, to the nearest five cents, is

(A) 215.05 cents (B) 21 505 cents (C) \$2.15 (D) \$215.05

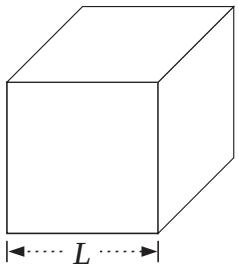
---

11 If $\Delta < -3$, then Δ can have the value

(A) 0 (B) $-\frac{1}{3}$ (C) –2 (D) –4

---

12 NOT TO SCALE



The volume of a cube is 64 cubic centimetres.

The side length (L) of the cube is

(A) 4 cm

(B) 8 cm

(C) 16 cm

(D) 32 cm

Complete your answers to Questions 13–25 on Section 1—Answer Sheet 2.

13 This timetable shows the times a bus departs from the terminal.

DEPARTURE TIMES					
am	4	53			
	5	10	35		
	6	08	28	43	58
	7	14	28	43	58
	8	13	28	47	
	9	17	47		
	10	17	47		

The first bus departs at 4:53 am.
Paula misses the 8:47 am bus by 3 minutes.

How long does she wait for the next bus?

---

14 Find $2\frac{1}{2}\%$ of \$600.

---

15 The fraction $\frac{61}{\square}$ has a value between 4 and 7, where $\square$ is a whole number.

What is a possible value for $\square$?

---

16 Each day Emily wears a jacket, a blouse and a pair of slacks.
She owns 2 jackets, 4 blouses and 3 pairs of slacks.

How many different combinations can she wear?

---

17 Jim bought a salad roll for \$6.00.
The next day the price had risen to \$6.60.

Find the percentage increase on the original price.

---

18 Ice-cream must be stored at –4°C.
The temperature of a freezer is 2°C.

What change in temperature is needed to store ice-cream?

---

19 A bottle of wine costs $10.
The wine itself costs $6 more than the bottle.

What is the value of the bottle?

20

HOLIDAY FUN TRAVEL	
Package 1	*Package 2*
5 nights, $1200	**7 nights, $1400**
includes:	includes:
return airfare	return airfare
accommodation	accommodation

What is the cost of a return airfare?

---

21 The recommended amount of a washing powder is one cup per wash.

If the recommended amount of powder is used per wash, then a box contains enough powder for 24 washes.

Theresa uses only $\frac{3}{4}$ cup each wash.

How many washes will she get from a box?

22

$$1 = 1 = \frac{1}{2}(3 \pm 1)$$

$$1+4 = 5 = \frac{2}{2}(6 \pm 1)$$

$$1+4+7 = 12 = \frac{3}{2}(9 \pm 1)$$

$$1+4+7+10 = 22 = \frac{4}{2}(12 \pm 1)$$

Use the pattern to find the value of

1 + 4 + 7 + 10 + . . . + 25

Each of Questions 23, 24 and 25 may have MORE THAN ONE correct answer. Fill in EVERY answer for each of these questions on Section 1—Answer Sheet 2.

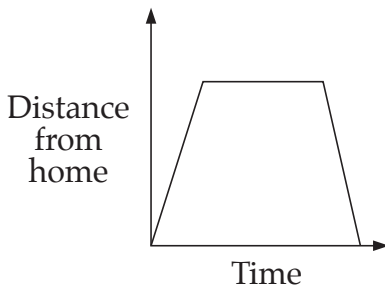
23 7.3×5 is the same as

(A) $7.3 \times 10 \div 2$ (B) $7.3 \div 10 \times 2$ (C) $73 \div 0.5$ (D) 73×0.5

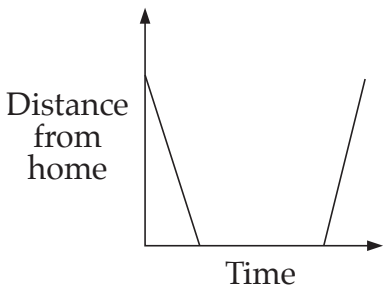
24 Peta rides to school in the morning and back home in the afternoon.

Which of the following could represent this information?

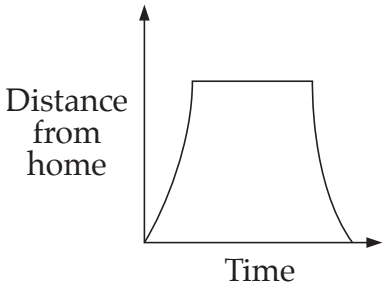
(A)



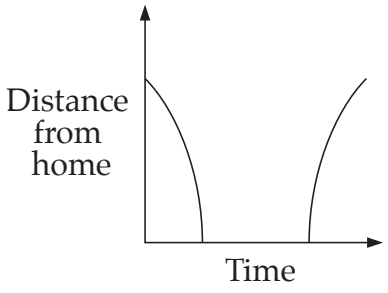
(B)



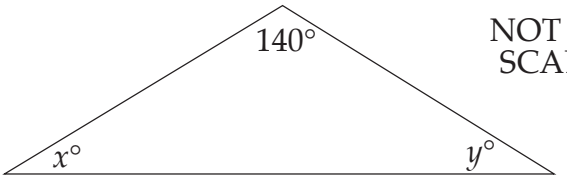
(C)



(D)



25



In the triangle, the values of x and y could be

(A) $x = 40$ and $y = 0$ (B) $x = 20$ and $y = 20$

(C) $x = 45$ and $y = 5$ (D) $x = 25$ and $y = 15$

End of questions in Section 1 that may require you to fill in more than one correct answer.

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MATHEMATICS

SECTION 2
Part A

CENTRE NUMBER

STUDENT NUMBER

Directions for Section 2—Part A

1 You have 90 minutes to answer Section 2 Part A and Part B

2
- Part A Questions 26–75 (50 marks)
- Allow about 60 minutes to answer this part

3 Calculators may be used in this part

4
- Complete your answers to Questions 26–50 on Section 2—Part A—Answer Sheet 3
- Complete your answers to Questions 51–69 on Section 2—Part A—Answer Sheet 4
- Complete your answers to Questions 70–75 in this booklet

5 Write your Centre Number and Student Number at the top of this page

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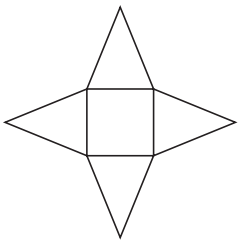
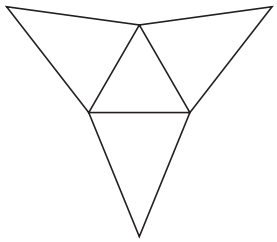
Complete your answers to Questions 26–50 on the Section 2—Part A—Answer Sheet 3.

26 Which of the following is a net of a triangular pyramid?

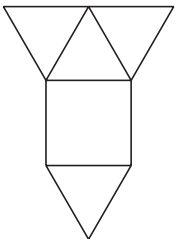
(A)



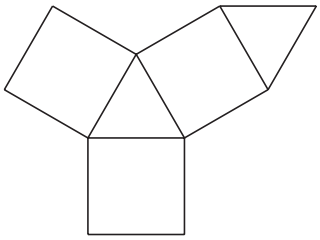
(B)



(C)



(D)



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27 A group of Year 10 students draw a one-metre square on the ground.

Estimate the greatest number of students of average size that can stand in the square with both feet on the ground.

(A) 5 (B) 16 (C) 30 (D) 36

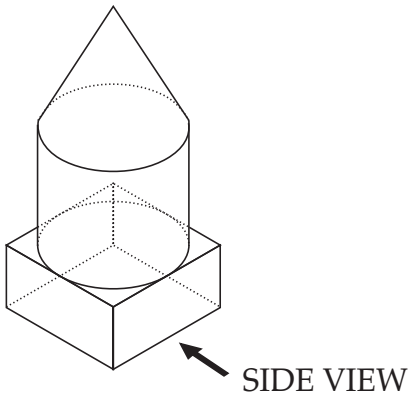
---

28 Anike is a plumber's assistant.
She is paid an additional $1.75 per hour for working in a confined space.
Her usual rate is $9.50 per hour.

How much will she earn for working in a confined space for 8 hours?

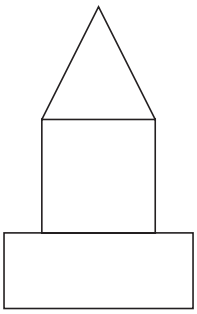
(A) $14.00 (B) $23.50 (C) $77.75 (D) $90.00

29

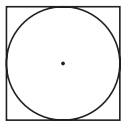


Which of the following represents the side view of this solid?

(A)



(B)



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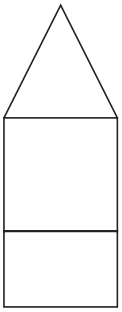

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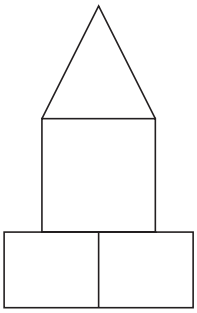

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30 A consultant's fee is \$245 for eight hours work.
To calculate her earnings (E) over a period of time she uses the formula

$$E = \frac{245n}{8}$$

What does n represent?

(A) The earnings per day

(B) The number of days worked

(C) The number of hours worked

(D) The earnings per hour

---

31 The table shows the distance between towns.

Dover	1160	880	387	210
	Bass	539	1371	958
		Milf	966	560
			Oxley	479
				Hume

The distance between Bass and Hume is 958 km.
Fatima travelled from Milf to Hume and then from Hume to Dover.

How far did she travel altogether?

(A) 350 km (B) 560 km (C) 770 km (D) 880 km

---

32 A mobile phone company is offering mobile phones, with conditions. These conditions are:

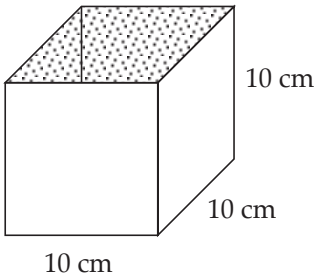
- a purchase price of $10
- an initial connection fee of $65
- a connection for at least 18 months
- an access fee of $30 per month.

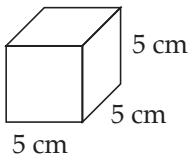
What is the total minimum cost for the first 18 months (excluding phone calls)?

(A) $435 (B) $540 (C) $605 (D) $615

---

33 How many 5 cm cubes can be packed in a box which measures 10 cm by 10 cm by 10 cm?

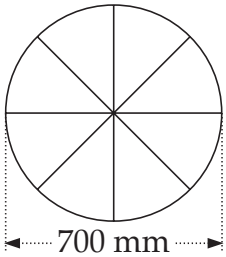




NOT TO SCALE

(A) 4 (B) 8 (C) 10 (D) 16

34

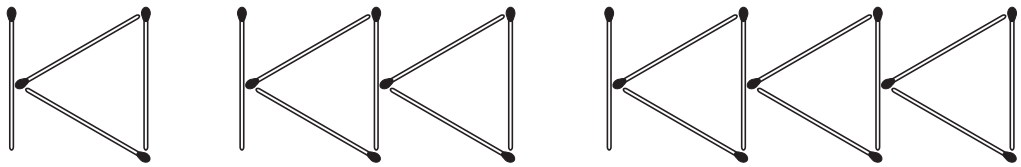


Ted's bicycle wheel has a diameter of 700 mm.

Approximately how far does his bicycle travel when the wheel makes 10 revolutions?

(A) 2 m (B) 7 m (C) 20 m (D) 44 m

35



For the pattern, Kim writes the rule, 'the number of matches equals three times the number of triangles plus one'.

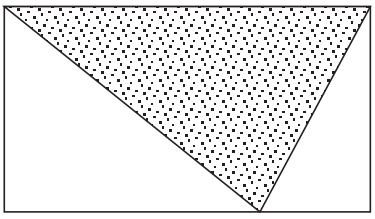
Using m = the number of matches
t = the number of triangles,

the rule may be written as

(A) $m = 3t + 1$ (B) $3m = t + 1$

(C) $m + 1 = 3t$ (D) $3m + 1 = t$

36



The shaded area in the rectangle represents 5 square metres.

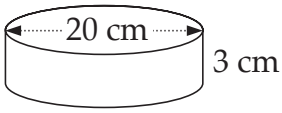
The ratio of the shaded area to the unshaded area is

(A) 1 : 1 (B) 1 : 2 (C) 1 : 3 (D) 2 : 1

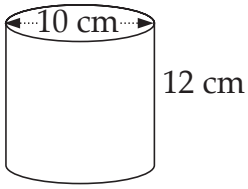
---

37 Which of the following containers has a capacity of 1 litre?

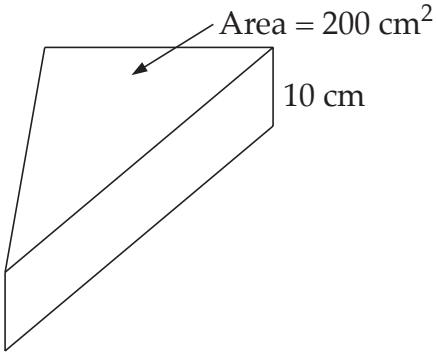
(A)



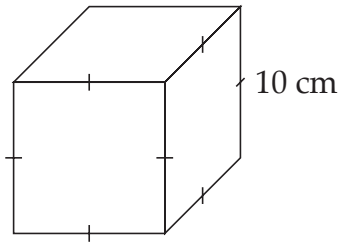
(B)



(C)



(D)



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38 A tap drips 8 times per second.
Five drops make 1 mL.

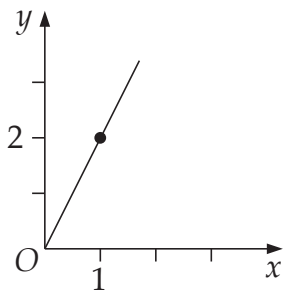
How much water drips in 1 hour?

(A) 2.4 L (B) 5.76 L (C) 96 L (D) 144 L

---

39 Which graph represents the rule, 'each y-value is twice the x-value'?

(A)



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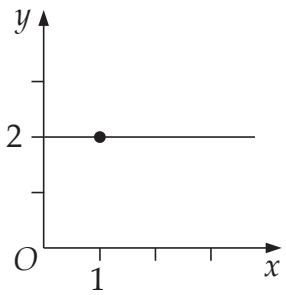
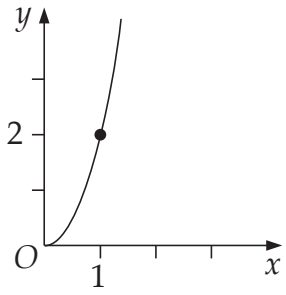
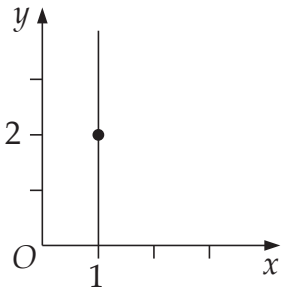


(C)



(D)



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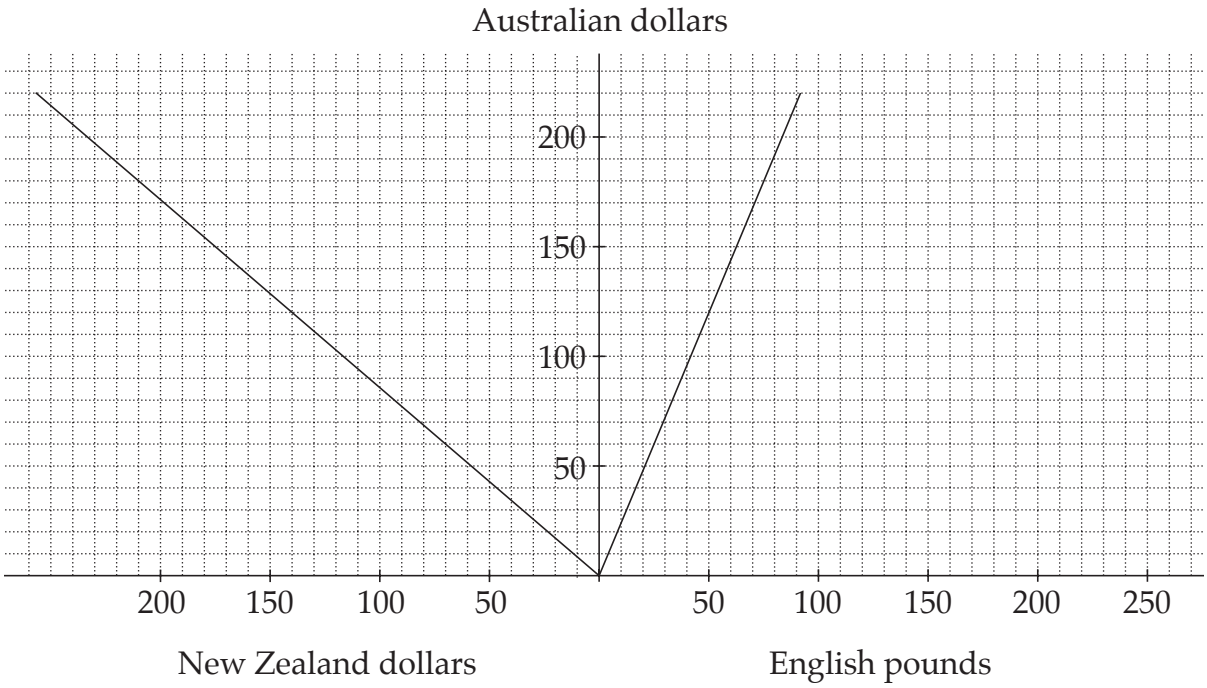
40 Keryn paid \$9 for a leg of lamb which weighed one kilogram.
When the bone and fat were removed, she had 750 g of meat that she could use.

What was the price per kilogram of the meat she could use?

(A) \$2.25 (B) \$6.75 (C) \$11.25 (D) \$12.00

---

41 This graph can be used to convert between Australian dollars, English pounds and New Zealand dollars.



How many New Zealand dollars are equivalent to 50 English pounds?

(A) 18 (B) 20 (C) 60 (D) 140

---

42 At a school there are 100 boys and 140 girls.
The school surveys the students about their favourite TV channel.

Which sample would provide the most reliable results?

(A) 50 boys and 70 girls

(B) The first 100 students to arrive at school

(C) 40 boys and 40 girls

(D) 10 boys and 14 girls

---

43 The daily traffic flow on a road in January was 54 738.
This was 12% lower than in December.

The daily traffic flow in December was

(A) 6569 (B) 48 169 (C) 61 307 (D) 62 202

---

44 A shop owner has the word APPLES painted on the outside of his window.

What does he see from inside the window?

(A) SELꟻꟻA (B) ƧƎLIPPA (C) ƧƎLꟻꟻA (D) SELPPA

45

TICKET PRICES					
	Adult	*Child*	*Senior pensioner*	*Family (2 adults + 2 children)*	*Extra child*
Zoo including Ferry	$24.80	$12.30	—	—	$8.00
Funland	$38.40	$26.80	$26.00	—	$25.00
Mountain Highlights	$42.20	$17.60	$28.00	$99.00	Free
Mountain Explorer Bus	$29.20	$10.60	$16.00	$69.00	Free

A family which includes 2 adults, their 3 children and 2 senior pensioners buys tickets for Mountain Highlights.

The lowest amount they could pay for their tickets is

(A) $101 (B) $122.20 (C) $155 (D) $193.20

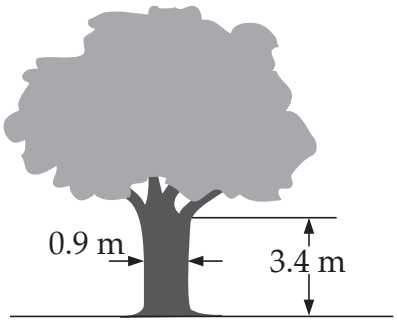
---

46 The amount of usable timber in a tree is calculated using the formula

$$v = 0.5hd^2 + 10$$

where d = the diameter of the tree
h = the height to the first branch
v = amount of usable timber, in cubic metres.

The amount of usable timber in this tree, to two decimal places, is



(A) 11.38 m^3 (B) 11.53 m^3 (C) 12.34 m^3 (D) 15.20 m^3

---

47 A four-sided figure has

- two pairs of equal sides, and
- one axis of symmetry.

The figure must be a

(A) kite.
(B) parallelogram.
(C) rectangle.
(D) trapezium.

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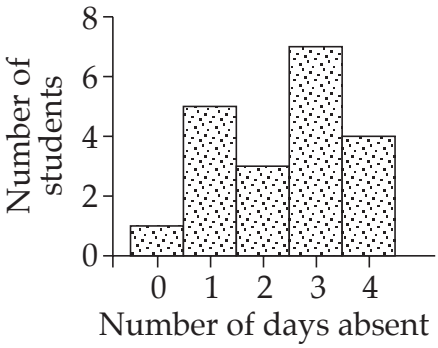
48 A teacher recorded the number of days that her students were absent.

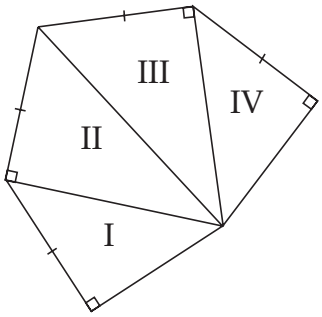


A student is chosen at random.

The probability that this student had 3 days absent is

(A) $\frac{3}{20}$ (B) $\frac{7}{20}$ (C) $\frac{3}{7}$ (D) $\frac{7}{8}$

49



The diagram shows four triangles labelled I, II, III and IV.

Which statement is true?

(A) Triangle I is congruent to triangle II.

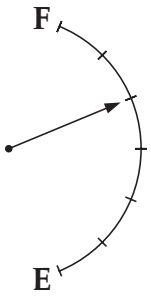
(B) Triangle I is congruent to triangle III.

(C) Triangle I is congruent to triangle IV and triangle II is congruent to triangle III.

(D) Triangle I is congruent to triangle II and triangle III is congruent to triangle IV.

---

50 A fuel tank can hold 84 litres.
The gauge shows the amount of fuel in the tank.

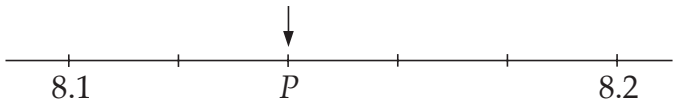


How much fuel is needed to fill the tank?

(A) 24 L (B) 28 L (C) 56 L (D) 60 L

Complete your answers to Questions 51–69 on the Section 2—Part A—Answer Sheet 4.

51 Write the decimal value represented by P.



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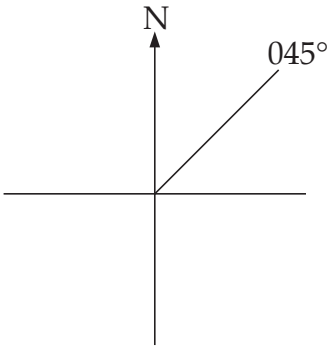
52 Simone is facing a tower on a bearing of 045°.
She turns to face another tower on a bearing of 350°.



What is the smallest angle through which Simone could have turned?

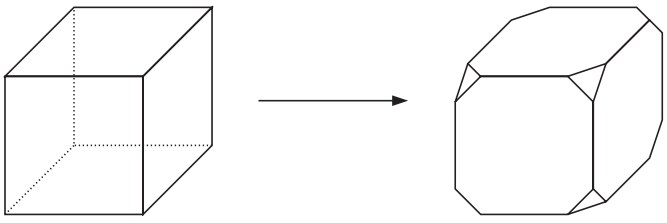
---

53 Every day Winnie arrives 5 minutes late for work.
Each year she works 5 days per week for forty-eight weeks.

Find the total number of hours that Winnie is late in one year.

---

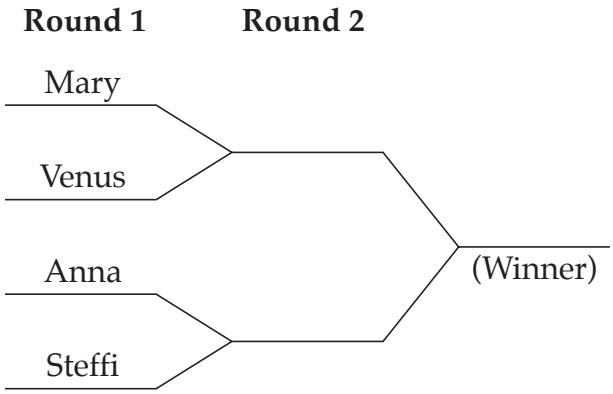
54 A cube has the corners removed as shown.



How many edges does the new shape have?

---

55 In a tennis tournament, players need to win their matches to progress to the next round.



If there are 4 players, the winner plays 2 matches, as shown.

How many matches does the winner play if there are 64 players?

56

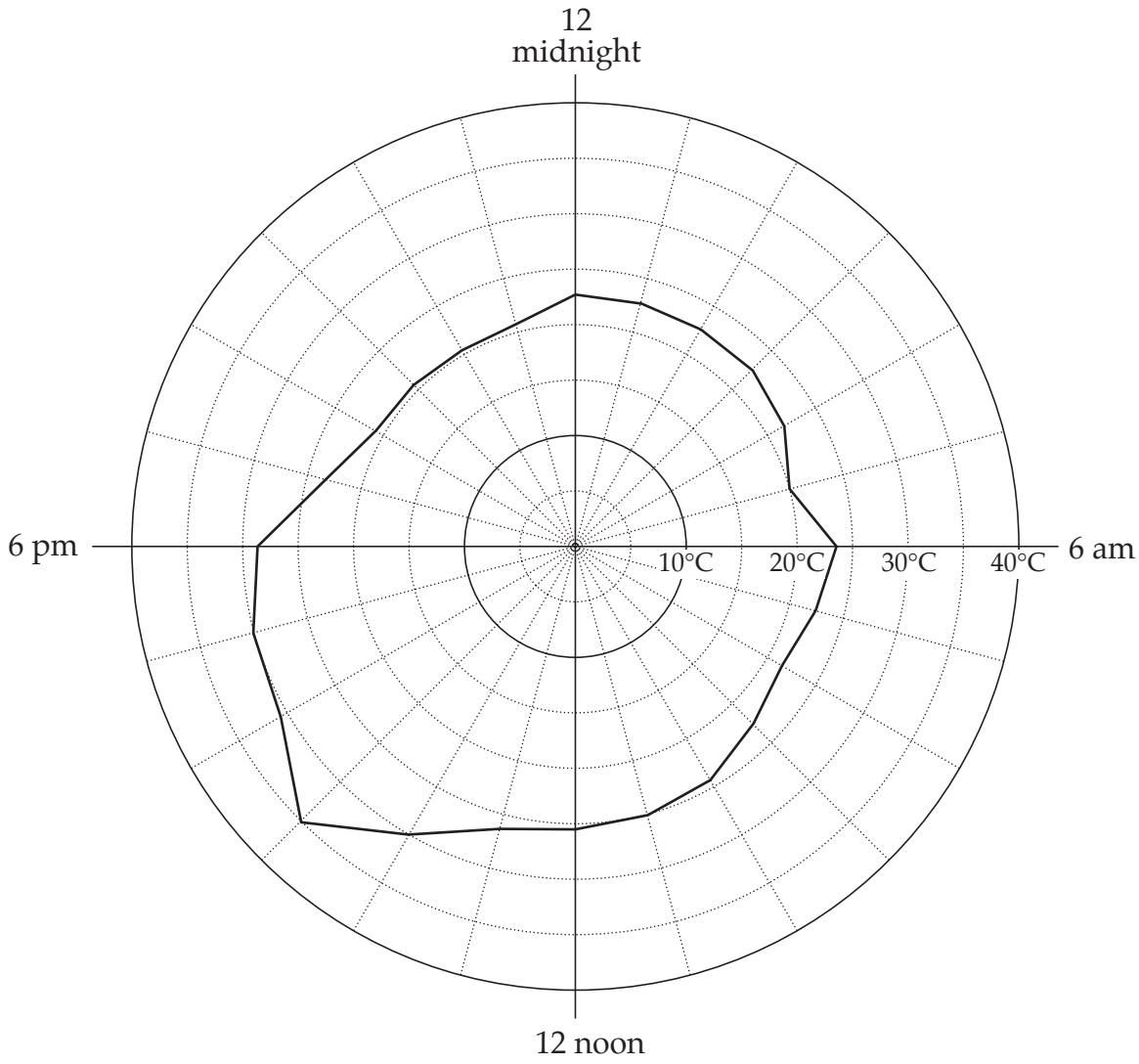
TRAIN TIMETABLE					
		am	am	am	am
Beronga		10:00	10:21		10:57
Kerang		10:04	10:25		
Aston		10:09	10:30		
Hornbel	arrival	10:12	10:33		11:06
	departure	10:13	10:43	10:42	11:07
Epson			10:51	10:56	11:16
Stratton		10:20		11:15	11:27
Rhodes		10:45	11:22	11:27	11:35

Elise lives at Beronga and is meeting a friend at 11:30 am.
The meeting place is a 10-minute walk from Stratton station.

What is the latest train she can catch from Beronga to be at the meeting on time?

---

57 This graph shows the temperatures during a day.



What is the range in temperature for that day?

58 The following stem-and-leaf plot represents the results of a class project.

Boys		Girls
0 0	5	0
9 8 6 4	4	2 4
8 7 5	3	3 4 7
6	2	6 7
8	1	2 4
	0	7

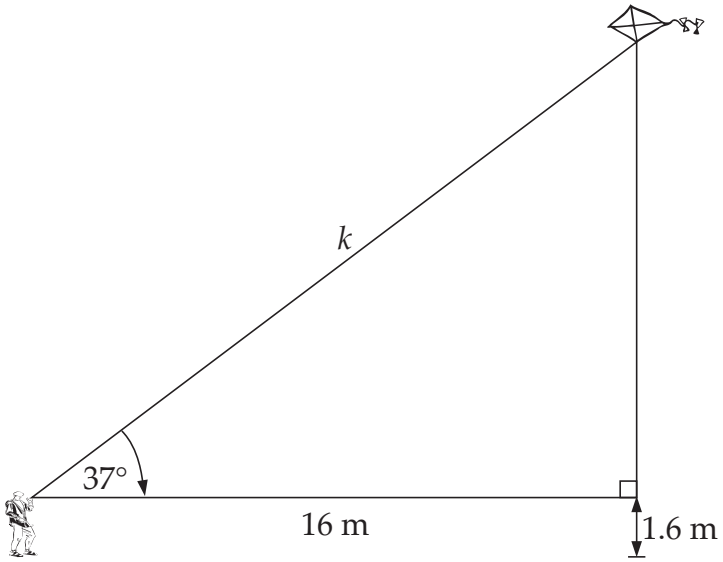
What is the difference between the medians for boys and girls?

---

59 There are 7.2 million employees in Australia.
This number increases by 3 hundred thousand per year for twelve years.

How many employees will there be at the end of the twelve years?

60



The string of the kite makes an angle of 37° with the horizontal as shown in the scale drawing.

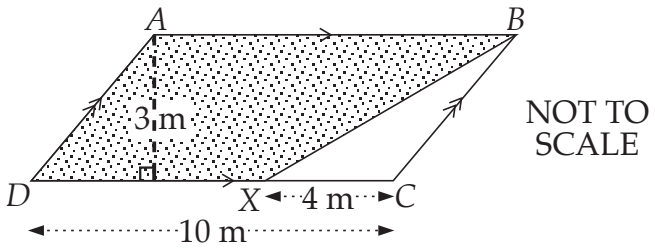
Find the length of the string k (correct to one decimal place).

---

61 The perimeter of a rectangle is 20 centimetres.
The lengths of the sides are whole centimetres.

Give a possible value for the area of the rectangle.

62



Calculate the shaded area.

---

63 The cost of a taxi fare is calculated using the following table.

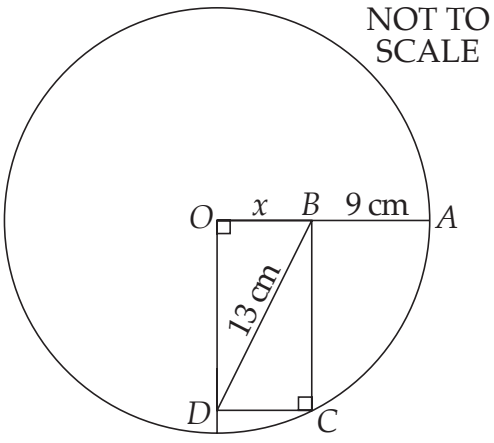
TAXI FARE

\$2 hire fee
plus
\$1.70 per km

Peter paid \$27.50 for a taxi fare.

How far did he travel?

64



O is the centre of a circle.

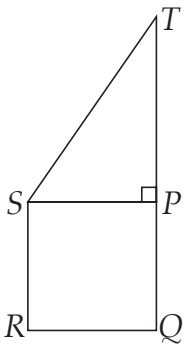
OA is a radius.

OBCD is a rectangle.

Find the value of x.

Each of Questions 65, 66, 67, 68 and 69 may have MORE THAN ONE correct answer. Fill in EVERY correct answer for each of these questions on Section 2—Answer Sheet 4.

65



PQRS is a square.

QR = 10 cm.

What additional information will allow you to calculate the area of *QRST*?

(A) *PQ* (B) *PR* (C) *QT* (D) *ST*

---

66 Which of the following are true statements?

(A) $a - a \times a = a$

(B) $a + a - a = a$

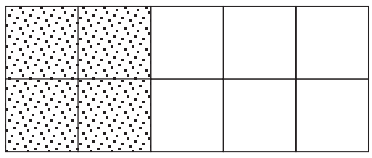
(C) $a \times a \div a = a$

(D) $a \div a \times a = a$

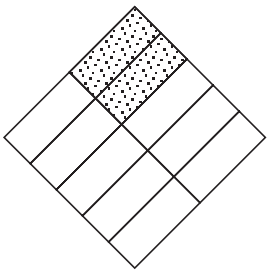
---

67 Which of the following represents 0.2?

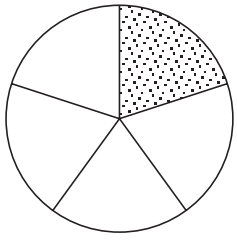
(A)



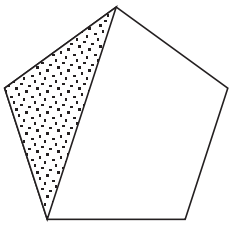
(B)



(C)



(D)



---

68 A solution to an equation is $C = 40$.

The question could have been

(A) $2C^2 = 3200$

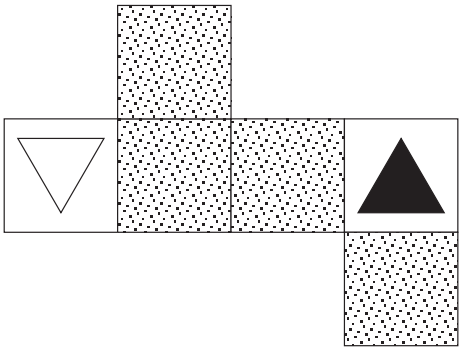
(B) $C^2 = \sqrt{50^2 \pm 30^2}$

(C) $C = 9 \times 5 - 85$

(D) $95 = 5 \times 11 + C$

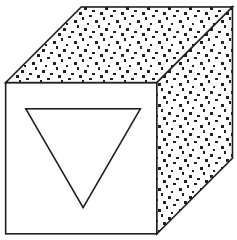
---

69 The net of a cube is shown.

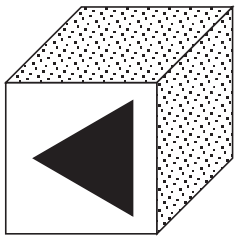


Which of the following could this cube be?

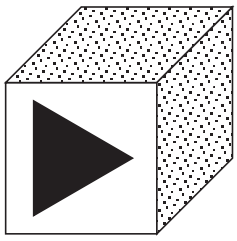
(A)



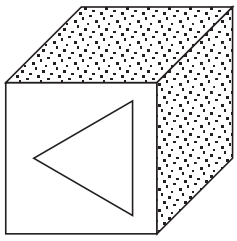
(B)



(C)



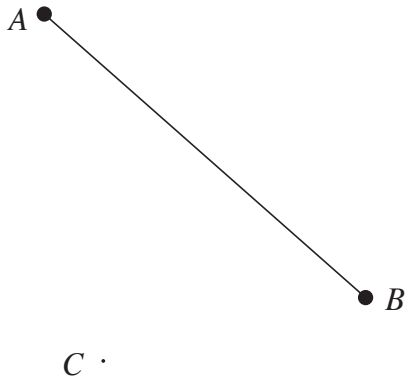
(D)



End of questions in Section 2 Part A that may require you to fill in more than one correct answer.

Complete your answers to Questions 70–75 in this booklet.

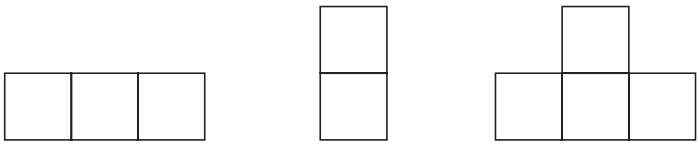
70 *AB* represents the runway at an airport.



A second runway is to be built through *C*, perpendicular to *AB*.
Complete the diagram to show the new runway.

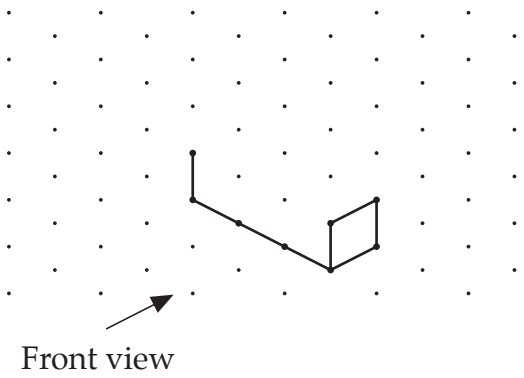
---

71 Three views of a three-dimensional shape are shown below.

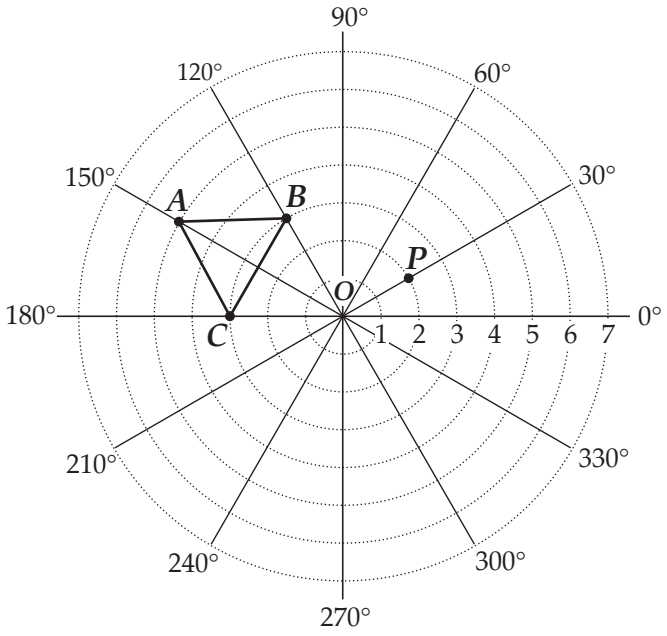


Top view Side view Front view

Complete the drawing of this shape.



Use the following diagram to answer Questions 72 and 73.



72 *P* has coordinates (2, 30°)

P is rotated 180° about 0.

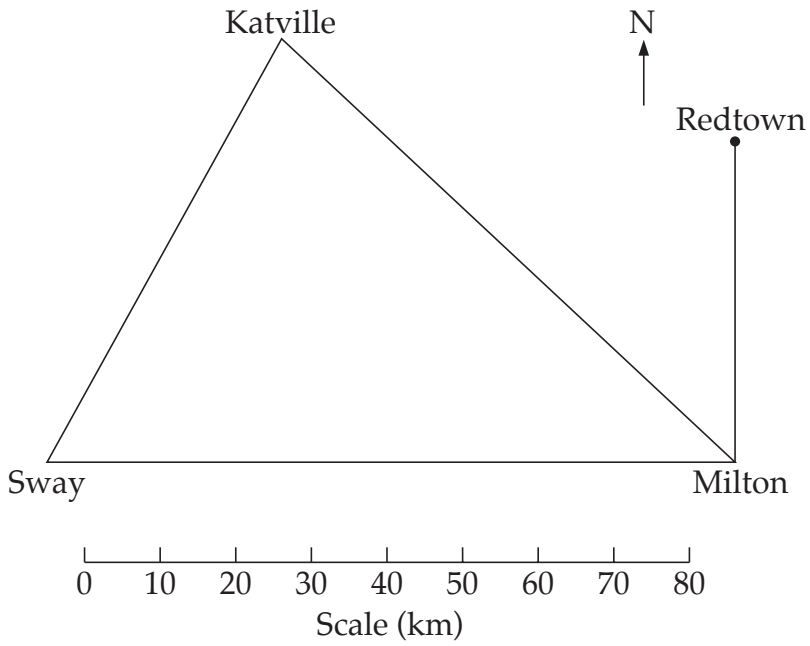
What are the new coordinates of *P*?

(☐☐☐ , ☐☐☐°)

73 Triangle *ABC* is rotated 90° clockwise about *O*.

Draw the triangle in its new position.

Use the following diagram to answer Questions 74 and 75.



74 Lindhurst is located on the road from Katville to Milton.
The road from Sway to Lindhurst bisects the angle made by the roads at Sway.

Use geometrical instruments to draw the road from Sway to Lindhurst.

75 Hatson is 80 km from Katville and 35 km from Milton.
It is east of the road from Milton to Redtown.

Mark the position of Hatson with an ×.

End of Section 2 Part A

Go on to Part B

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BOARD OF STUDIES
NEW SOUTH WALES

1999 SCHOOL CERTIFICATE TEST

9 November

MATHEMATICS

SECTION 2 Part B

CENTRE NUMBER

STUDENT NUMBER

Directions for Section 2—Part B

1 • Part B Questions 76–80 (25 marks)

• Allow about 30 minutes to answer this part

2 Calculators may be used in Section 2

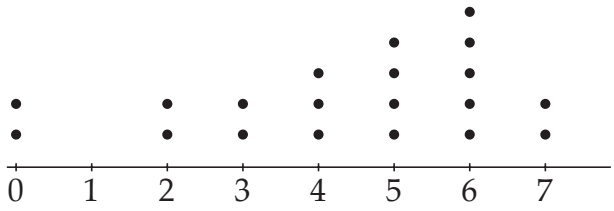
3 Complete your answers to Questions 76–80 in this booklet

4 Do NOT write in pencil

5 Write your Centre Number and Student Number at the top of this page

Question 76 (5 marks)

The dot plot shows the number of goals per game scored by Stephen's team during a soccer competition.



Number of goals per game

(a) How many games did Stephen's team play?

.....

.....

(b) What was the median number of goals scored per game?

.....

.....

(c) What was the average number of goals scored per game, to one decimal place?

.....

.....

(d) In what percentage of games did Stephen's team score 6 or more goals?

.....

.....

(e) A sector graph is to be drawn to represent the above information.

What angle at the centre of the graph would represent the number of times exactly 5 goals were scored?

.....

.....

Question 77 (5 marks)

A small car uses 30 litres of petrol to travel 465 km.

(a) At this rate, what is the maximum distance the car can travel using 60 litres of petrol?

.....

.....

(b) What is the average distance travelled per litre of petrol?

.....

.....

(c) Find the number of litres used to travel 100 km, correct to one decimal place.

.....

.....

(d) Petrol costs 69.9 cents per litre.

Find the cost of the petrol needed to travel 100 km. Give your answer to the nearest cent.

.....

.....

(e) A larger car uses 30 litres to travel 305 km.

At this rate, how far can it travel on a full tank if the tank holds 72 litres?

.....

.....

Question 78 (5 marks)

The information below is from a label on a package of noodles.

NUTRITION INFORMATION

Servings per package: 25 Serving size: 12 g		
	Per serving (12 g)	**Per 100 g**
Energy	55 calories	457 calories
Protein	1.0 g	8.8 g
Fat	2.4 g	20 g
Carbohydrates		
Total	7.5 g	62 g
Sugars	0.8 g	6.4 g
Sodium	171 mg	1430 mg
Potassium	—	—

(a) How many grams are there in one serving of noodles?

.....

(b) What is the percentage of *fat* in the noodles?

.....

.....

(c) What is the total number of grams of *fat* in the package?

.....

.....

(d) James uses 10 calories per minute when he is jogging.

How many minutes would James need to jog to use the calories from a single serving of noodles?

.....

.....

(e) The average *daily requirement* of sodium is 230 milligrams per day.

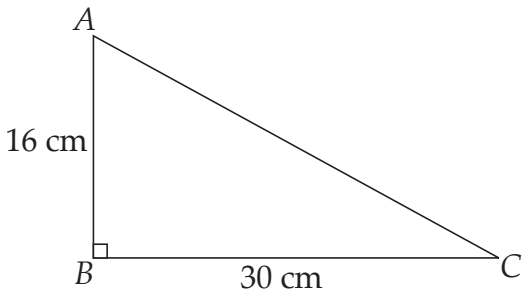
How many grams of noodles would need to be eaten for this *daily requirement*? Give your answer to the nearest gram.

.....

.....

Question 79 (5 marks)

In ΔABC, $AB = 16$ cm, $BC = 30$ cm and $\angle ABC = 90°$.



(a) Write your answer A, B, C or D to the following in the space provided.

The triangle is

(A) right-angled and isosceles.

(B) acute-angled and scalene.

(C) right-angled and scalene.

(D) acute-angled and isosceles.

.....

(b) Show that the length of AC is 34 cm.

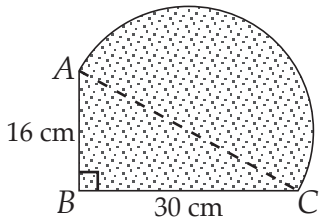
.....

.....

.....

Question 79 (Continued)

(c) A semicircle with diameter AC is drawn on triangle ABC.



(i) Write your answer A, B, C or D to the following in the space provided.

The area of the semicircle to the nearest square centimetre is

(A) 454

(B) 908

(C) 1816

(D) 3236

.....

(ii) Find the shaded area.

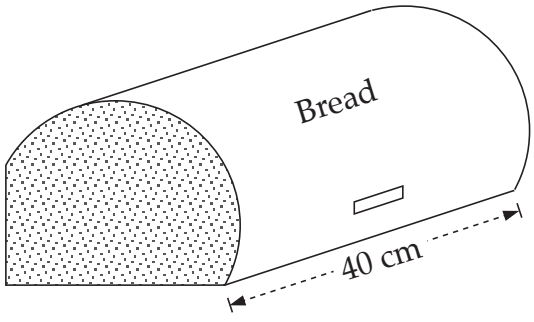
.....

.....

.....

(d) The shaded area in part (c) represents one end of a bread container.

The length of the container is 40 cm.



Calculate the volume of the container. Give your answer to the nearest cubic centimetre.

.....

.....

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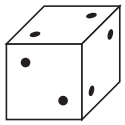
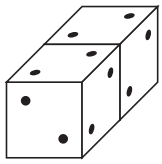
Question 80 (5 marks)

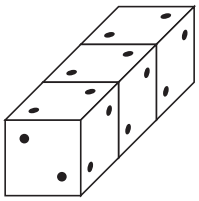
If we place two dots on each face of a cube, there will be 12 dots on the outer surface.



If two cubes are joined as shown, the number of dots on the outer surface will be 20.



Three cubes joined in the same way will give 28 dots.



(a) Four cubes are joined in the same way.

How many dots will there be on the outer surface?

.....

.....

(b) Find the total number of dots on the outer surface of seven cubes joined in the same way.

.....

.....

(c) How many dots will there be on the outer surface of n cubes joined in the same way?

.....

.....

(d) How many cubes, joined in the same way, are needed if there are to be 236 dots on the outer surface?

.....

.....

.....

End of test

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