NAME: _____ REG NO: (   ) CLASS: SEC 1 / ___

TEMASEK SECONDARY SCHOOL
FINAL TERM EXAMINATION 2006

MATHEMATICS
PAPER 1

12 October 2006

TIME: 1 hour

SECONDARY ONE EXPRESS

INSTRUCTIONS TO PUPILS

Write your name, register number and class in the spaces at the top of this page.

Answer **all** questions.

Write your answers in the spaces provided on the question paper.

If working is needed for any question, show it clearly in the space below that question.

Omission of essential working will result in loss of marks.

ELECTRONIC CALCULATORS MUST NOT BE USED IN THIS PAPER.

INFORMATION FOR PUPILS

The number of marks is given in brackets [ ] at the end of each question or part question.

The total of the marks for this paper is **40**.

FOR EXAMINER'S USE
/ 40

This question paper consists of _9_ printed pages (including this cover page).

Pupils answer on the question paper.
No additional materials are required.

[Turn over]

Answer **ALL** questions.
Calculators or mathematical tables are **NOT** allowed to be used in this paper.
All working must be clearly shown.

1. Simplify $\left(-2\frac{1}{2} \div 2\frac{1}{4}\right) - \left(-\frac{2}{3}\right)$.

Answer .... [2]

2. Express 0.49999
    (a) correct to the nearest whole number,
    (b) correct to 2 significant figures.

Answer (a)........................... [1]

(b)........................... [1]

3. Estimate $\dfrac{0.003 + (1.998)^2}{3.012 + 5.999}$, leaving your answer as a fraction.

Answer .... [2]

4. Given that $p = 4$, $q = 7$, and $r = -\dfrac{5}{2}$, evaluate $\dfrac{r(\sqrt{p})+1}{2q}$.

Answer .... [2]

5. The product of prime factors of 40 and 3240 are shown below.

$$40 = 2^3 \times 5 \qquad 3240 = 2^3 \times 3^4 \times 5$$

Write down, as a product of prime factors, the positive square root of (40 x 3240).

Answer .... [2]

6. Simplify $4[c - 2(a + b - c) + (2a - b)] - 12c$.

Answer .... [2]

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7. Solve the equation $\dfrac{x-1}{3} + \dfrac{x+5}{2} = 8$.

Answer .... [3]

8. A bus sets off from Depot A. It travels at an average speed of 40 km/h. If the bus reaches Depot B, which is 70 km away, at 9.00 a.m., what time did the bus set off from Depot A?

Answer .... [2]

9. At a sale, a sofa set selling at a discount of 15% fetches $680. Find the original price of the sofa set.

Answer .... [2]

10. The diagram below shows a trapezium. Calculate the values of *x* and *y*. **State your reasons clearly for each.**

Answer *x* = ... [1]

y = ... [1]

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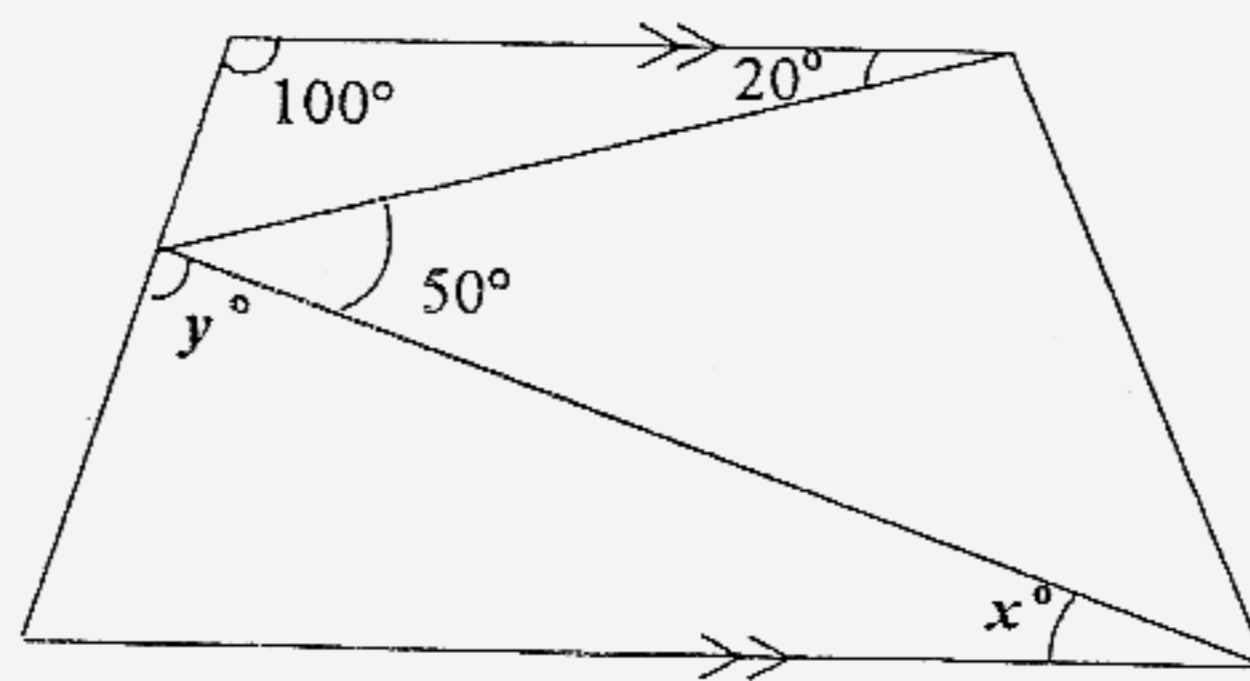
11. The diagram below shows a parallelogram ABCD and a right-angled triangle ADE. Find the area of quadrilateral ABCE.
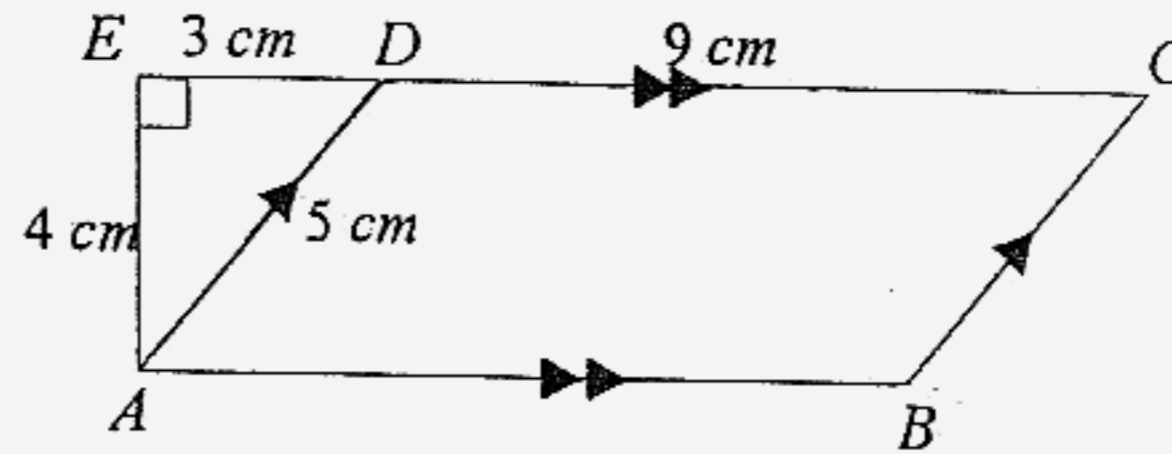
Answer .... [2]

___

12. (a) Construct △ABC in which AB = 8.2 cm, AC = 7.2 cm and ∠BAC = 48°. [2]

(b) Measure and write down the length of BC. [1]

(c) Construct the bisector of ∠ABC. [1]

(d) Let the bisector cut AC at point K. Measure and write down the length of AK.

(e) Construct the perpendicular bisector of BC. [1]

Answer (b) BC =...................... [1]

(d) AK =...................... [1]

13. The diagram below shows a wooden table with square top and 4 identical cylindrical legs. The square table top has width 50 cm and thickness 4 cm. Each cylindrical leg has radius 2 cm and height 35 cm.

(a) Calculate
   (i) the volume of the wooden table,
   (ii) the mass of the table, in kg, if the density of wood is 2 g/cm³.
   (Take π to be $\frac{22}{7}$.)
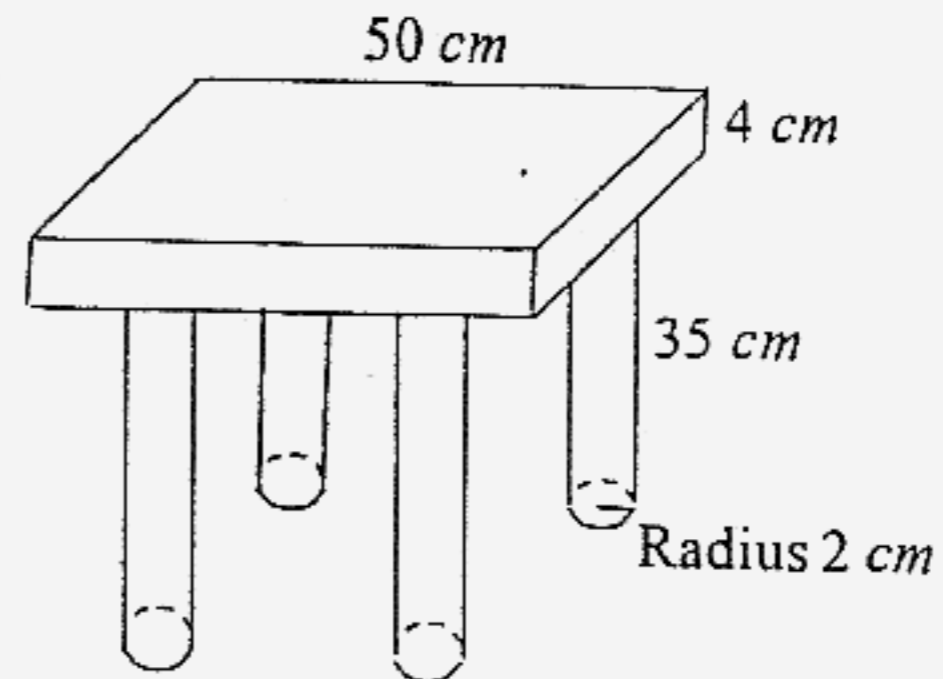
(b) A master carpenter takes 5 days to build 1 table, while a trainee carpenter take 7 days to build 1 table. If the master carpenter and the trainee carpenter work together, how many days will it take them to build 1 table? Leave your answer as a fraction.

Answer (a) (i) .... [2]

(ii)........................... [2]

(b)........................... [3]

8

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14. The line graph shows the number of babies born from 1997 to 2005 in a certain country.

Number of Births from 1997 to 2005
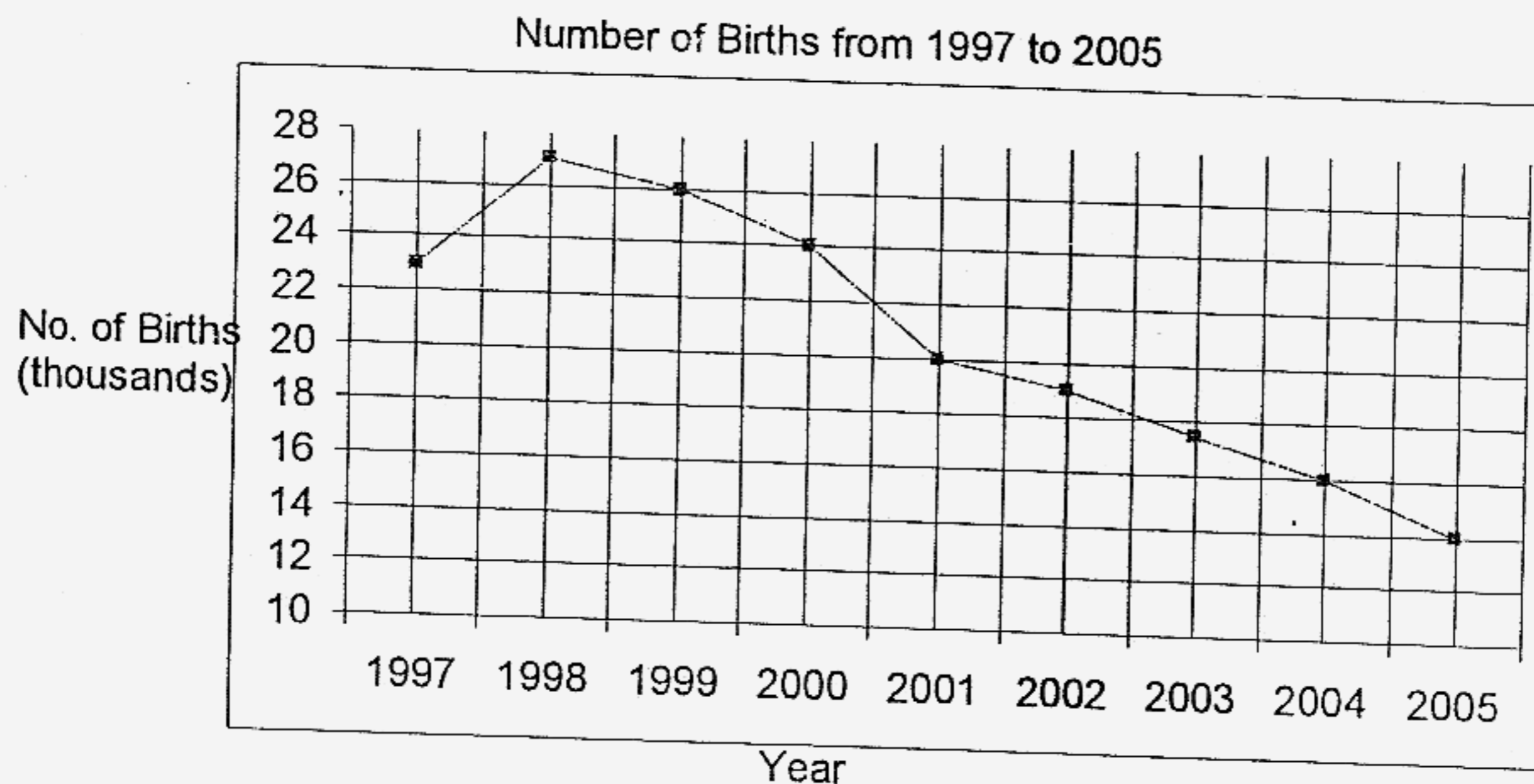
From the line graph,
(a)   write down the number of births in 2002,
(b)   write down the year with the highest number of births,
(c)   calculate the percentage decrease in births from year 1999 to year 2000. Leave your answer as a fraction.

Answer (a)................................. [1]

(b)................................. [1]

(c)................................. [2]

[End of Paper]

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TEMASEK SECONDARY SCHOOL
FINAL TERM EXAMINATION 2006

MATHEMATICS
PAPER 2

4 October 2006

TIME: 1 hour 15 mins

SECONDARY ONE EXPRESS

INSTRUCTIONS TO PUPILS

Write your name, register number, class, calculator's make and model in the spaces provided on the cover page.

Write your answers on the separate writing paper provided.

All necessary working must be shown clearly.

Omission of essential working will result in loss of marks.

Section A
Answer **all** questions.

Section B
Answer **one** question.

INFORMATION FOR PUPILS

The number of marks is given in brackets [ ] at the end of each question or part question.

The total of the marks for this paper is **50**.

If the degree of accuracy is not specified in the question and if the answer is not exact, the answer should be given to **three** significant figures. Answers in degrees should be given to **one** decimal place.

For π, use your calculator value or 3.142, unless otherwise stated.

This question paper consists of _6_ printed pages (including this cover page).

Additional materials: Writing paper   (5 sheets)
                       Cover page   (1 sheet)

[Turn over]

Answer **ALL** questions in this section.

1   Arrange the following numbers in descending order:

$$-\frac{1}{9}, \; -1.12, \; -0.112, \; -\frac{1}{8} \quad .$$

[2]

2   Simplify the expression $-4^2 - (-2)^2 + (x+y) - 5(y-x)$.

[2]

3   A train journey takes 5 h 50 min. The train travels at an average speed of 77 km/h. Calculate the time taken, in hours, for the same journey if the speed of the train was increased to an average speed of 98 km/h. Leave your answer as a fraction.

[3]

4   Ben bought 400 kg of tomatoes at a total cost of $800. 30% of the tomatoes were spoilt.

   (a)   How many kg of good tomatoes were there?

[1]

   (b)   Ben wants to make a profit of 40% from selling only the good tomatoes.
     (i)   Calculate the total amount of money he must get from selling the good tomatoes.
     (ii)   How much will he have to sell each kg of good tomato for?

[2]
[1]

5   27 workers can make 11 cupboards if they work for 5 hours. How many hours are needed to make 48 cupboards if there are 81 workers now? Leave your answer as a fraction. [3]

6   Mr Wong bought a new car for x . At the end of the first year, the car is worth 84% of x . At the end of the second year, the car is worth 75% of its worth at the end of the first year.

   (a)   Show that after two years, the car is worth $0.63x$.

[2]

If Mr Wong scraps the car after two years, he will get 65% of x . If he chooses to scrap the car, he will get $1300 more than if he sells it at $0.63x$.

   (b)   Find the value of x.
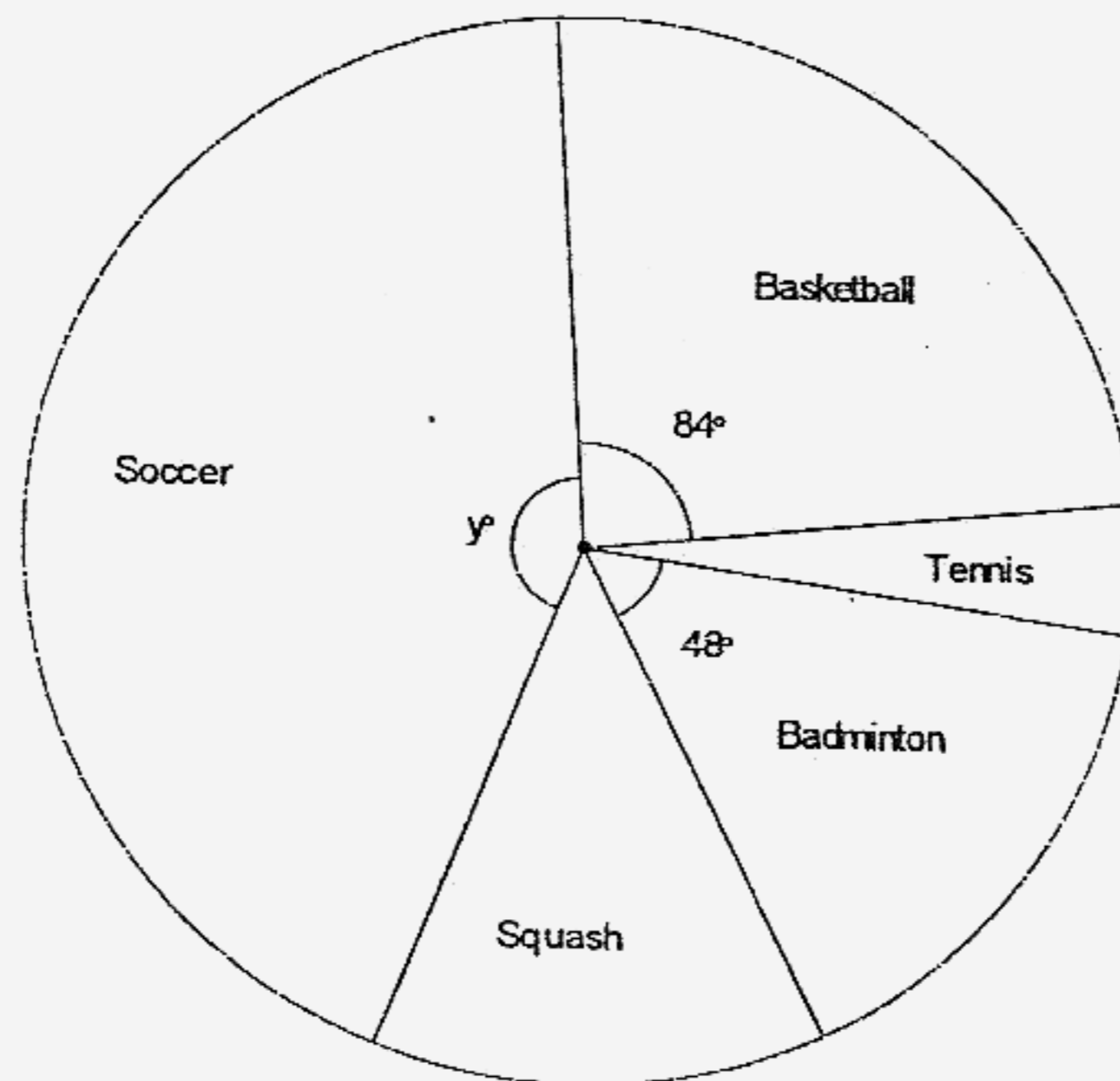
[2]

7   The figure below shows an isosceles triangle BCD, and a trapezium ABDE. CDE is a straight line.
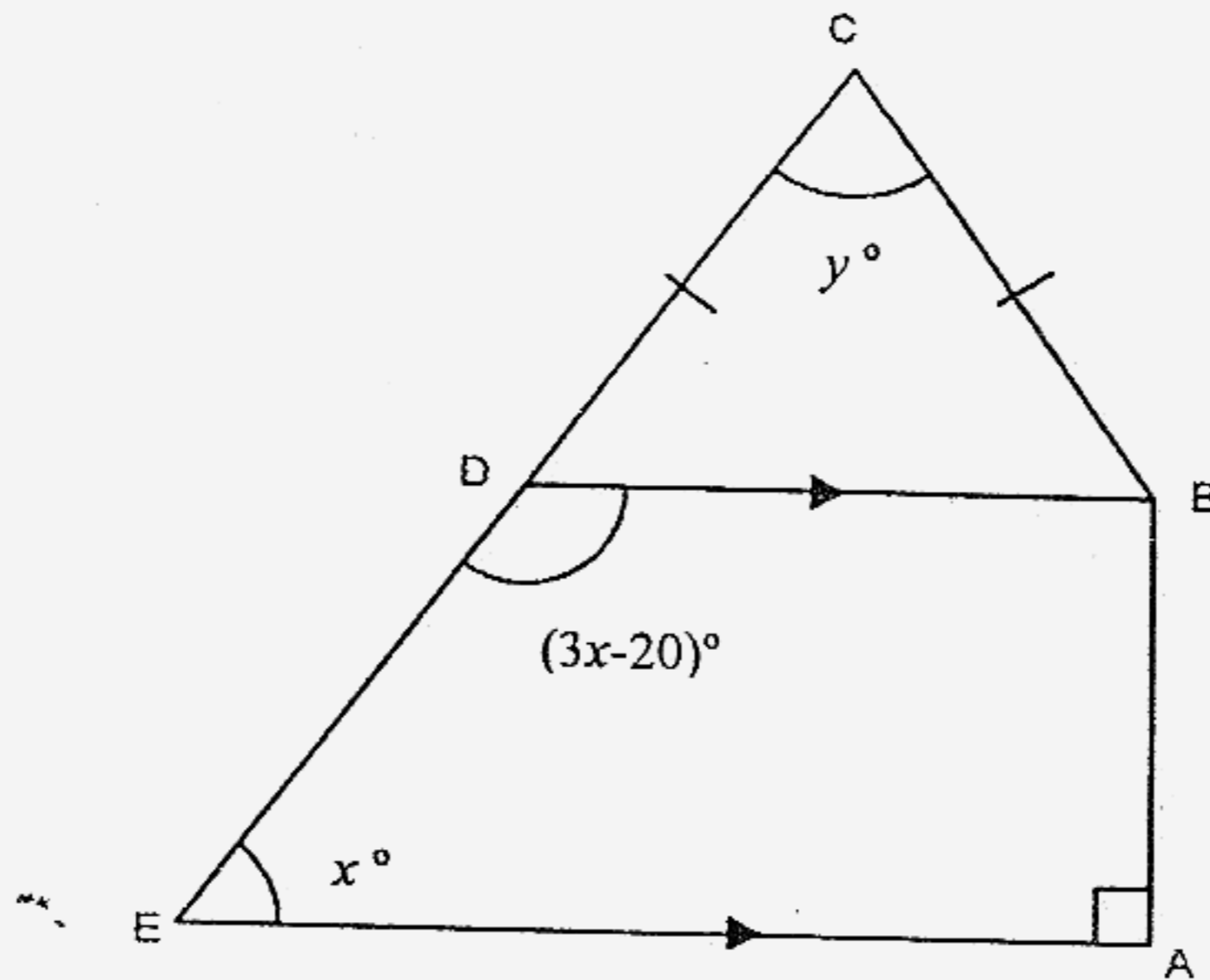
(i)   Find the value of x.   [2]

(ii) Find the value of y.   [2]

8   The following pie chart shows the favourite sport of 270 students.

(i)   Calculate the number of students whose favourite sport is basketball.   [1]

(ii) If the number of students who like soccer is 144, find the value of y.   [1]

(iii) Given that the number of students who like squash is twice the number of students who like tennis, find the number of students who like squash.   [4]

9   The figure below shows a parallelogram *ABCD*, a trapezium *ABCE* and a circle. The area of the parallelogram is 350 m².
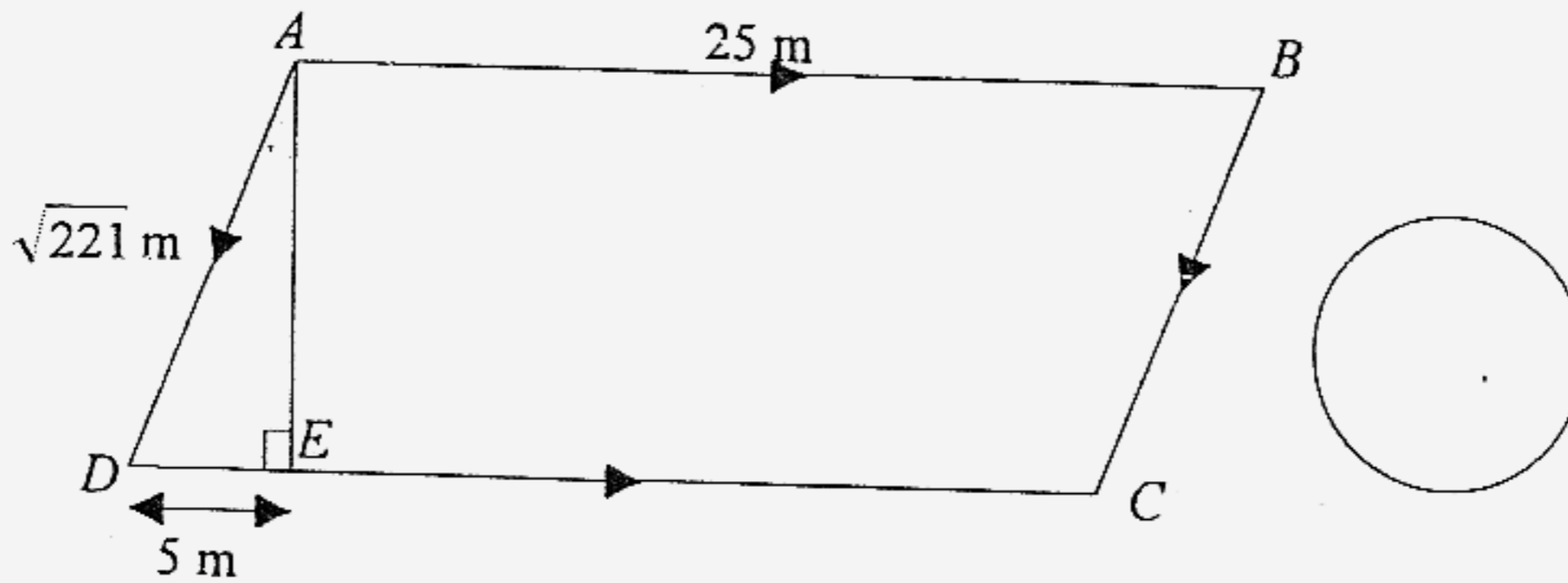

(a)   (i)   Find the length *AE*.

[1]

   (ii)   Find the area of the trapezium *ABCE*.

[2]

(b)   The ratio of the circumference of the circle to the perimeter of the parallelogram *ABCD* is 3:10. Find the radius of the circle.

[3]

10   Solve the equation $\frac{1}{6}(x+5) - 8(4-3x) = \frac{5}{4}(-x-7)$.

[3]

11   After every 8 min, bus service *A* sets off from the interchange. After every 13 min, bus service *B* sets off from the interchange. After every 16 min, bus service *C* sets off. Given that all three bus services left the interchange at 1149 h, find the next time all 3 services will leave the interchange together.

[3]

[End of Section A]

Section B (10 marks)

Answer only ONE question in this section.

12 Solid A is prism while solid B is a cylinder. All dimensions are given in cm. (Take π to be $\frac{22}{7}$).
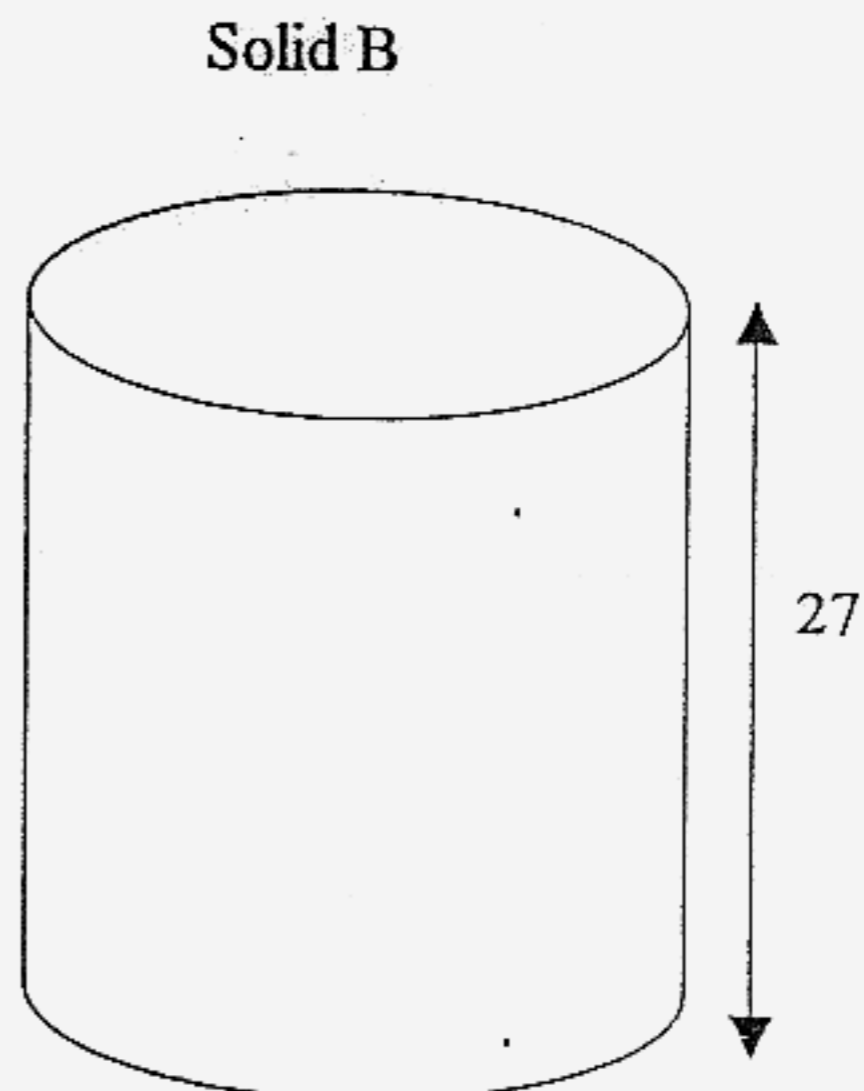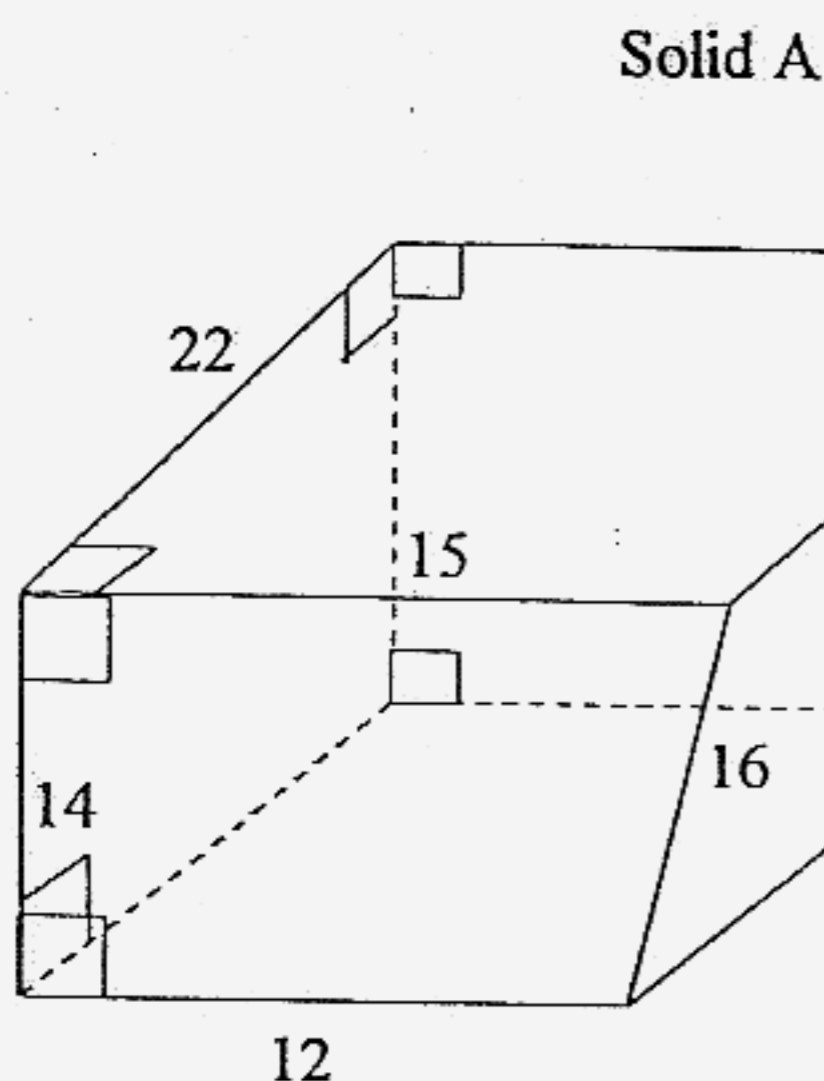
Solid A

Solid B

(a) Find the surface area of Solid A. [3]

(b) If it costs $0.60 to paint 1 square centimetre, find how much Charles has to pay if he wants to paint Solid A. Give your answer to the nearest dollar. [2]

(c) Find the volume of Solid A. [2]

(d) Solid A is now melted and reshaped into Solid B. Find the radius of Solid B. [3]

13 **(a)** The following bar chart shows the number of TV sets sold each month.
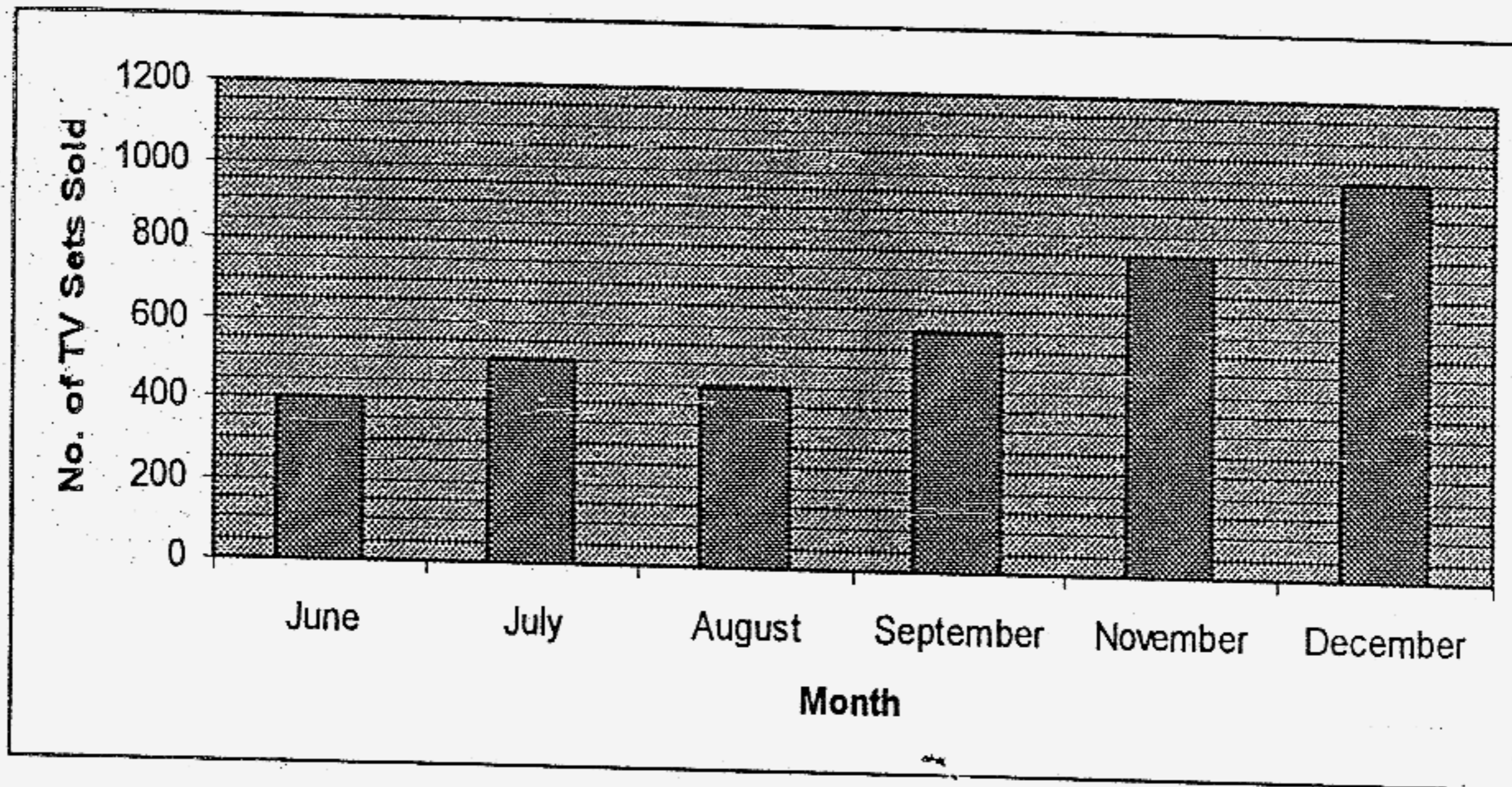
(i) In which month was there a decrease in the number of TV sets sold from the previous month. Calculate this percentage decrease. [2]

(ii) Find the ratio of the number of TV sets sold in the first three months to the number of TV sets sold in the last three months. [2]

(b) There are 48 more fruit tarts than egg tarts initially. After $\frac{5}{6}$ of the fruit tarts and $\frac{3}{4}$ of the egg tarts were eaten, there were 33 tarts left.

(i) Let x represent the number of egg tarts initially. Form an equation in x and solve the equation for x. [4]

(ii) What fraction of the eaten tarts were fruit tarts? [2]

Paper 1 Answers (40 marks)

1. $-\dfrac{4}{9}$

2.   (a)   0
             (b)   0.50

3. $\dfrac{4}{9}$

4. $-\dfrac{2}{7}$

5. $2^3 \times 3^2 \times 5$

6. $-12b$

7. $x = 7$

8.   7.15 am

9. $800

10. $x = 30, y = 120$

11.   42 cm^2

12.   (b) $BC = 6.3\ cm$
           (d) $AK = 4.1\ cm$

13.   (a) (i) 11 760 cm^2 (ii) 23.52 kg
           (b) $2\dfrac{11}{12}$ days

14.   (a) 19 000
           (b) 1998
           (c) $7\dfrac{9}{13}$ %

<u>Section A</u>

1. $-\dfrac{1}{9}, -0.112, -\dfrac{1}{8}, -1.12$ ---------- (2)

2. $-4^2 - (-2)^2 + (x+y) - 5(y-x)$

    $= -16 - 4 + x + y - 5y + 5x$ ---------- (1)

    $= 6x - 4y - 20$ ---------- (1)

3.   Total distance traveled $= 77 \times 5\dfrac{5}{6}$

    $\qquad\qquad\qquad\qquad = 449\dfrac{1}{6}$ km ---------- (1)

    Time taken if speed is 96 km/h $= 449\dfrac{1}{6} \div 98$ ---------- (1)

    $\qquad\qquad\qquad\qquad\qquad\quad = 4\dfrac{7}{12}$ h ---------- (1)

4.   a) $0.7 \times 400 = 280$ kg ---------- (1)

    bi) Total amount $= \dfrac{140}{100} \times 800$ ---------- (1)

    $\qquad\qquad\qquad = \$1120$ ---------- (1)

    bii) He must sell eack kg of good tomato for $1120 \div 280$

    $\qquad\qquad\qquad\qquad\qquad\qquad = 4$ kg ---------- (1)

5.   27 workers, 11 cupboards → 5 hours

    1 worker, 11 cupboard → 135 hours

    1 worker, 1 cupboard → $\dfrac{135}{11}$ hours ---------- (1)

    81 workers, 1 cupboard → $\dfrac{5}{33}$ hours ---------- (1)

    81 workers, 48 cupboards → $7\dfrac{3}{11}$ hours ---------- (1)

6.   a) 1ˢᵗ year: $\$0.84x$ ---------- (1)

           2ⁿᵈ year: $0.75 \times 0.84x = \$0.63x$ ---------- (1)

    b) $0.65x - 0.63x = \$1300$ ---------- (1)

         $x = \$65000$ ---------- (1)

7   i) $(3x-20)° + x° = 180°$ (interior angles) ---------- (1)

       $4x° = 200°$

       $x = 50$ ----------- (1)

   ii) $\angle CDB = 50°$ (corresponding angles) ---------- (1)

       $y° = 180° - 50° - 50°$ (angles in a triangle)

       $y = 80$ ----------- (1)

8   i) $\dfrac{84}{360} \times 270 = 63$ ----------- (1)

   ii) $\dfrac{144}{270} \times 360° = 192°$

       $y = 192$ ----------- (1)

   iii) Let tennis be $x°$, squash be $2x°$

       $3x + 192 + 84 + 48 = 360$ ----------- (1)

       $x = 12$ ----------- (1)

       Number of people who like squash $= \dfrac{2(12)}{360} \times 270$ ----------- (1)

                                 $= 18$ ----------- (1)

9   ai) AE $= 350 \div 25$

          $= 14$ m ----------- (1)

   aii) Area of ABCE $= \dfrac{1}{2}(25+20) \times 14$ ----------- (1)

                    $= 315$ m^2 ----------- (1)

   b) Perimeter of ABCD $= 2 \times (\sqrt{221} + 25)$

                      $= 79.732$ m ----------- (1)

       Circumference of circle $= \dfrac{3}{10} \times 79.732$

                          $= 23.9196$ m ----------- (1)

      $2\pi r = 23.9196$

      $r = 3.806 = 3.81$ (3 s.f.) ----------- (1)

10 $\quad \dfrac{1}{6}(x+5)-8(4-3x)=\dfrac{5}{4}(-x-7)$

$2(x+5)-96(4-3x)=15(-x-7)$ ---------- (1)

$2x+10-384+288x=-15x-105$ ---------- (1)

$305x=269$

$x=\dfrac{269}{305}$ or 0.882 (3 s.f.) ---------- (1)

11 $\quad$ LCM of 8, 13, 16 = 208 min

$\qquad\qquad\qquad$ = 3h 28 min ----------- (2)

Time = 1149 h + 3 h 28 min

$\qquad$ = 1517 h ----------- (1)

<u>Section B</u>

12 $\quad$ a) Surface area = $(14=15+12+16)\times 22+2[\dfrac{1}{2}\times(15+12)\times 14]$ ---------- (1)

$\qquad\qquad\qquad = 1254+378$ ---------- (1)

$\qquad\qquad\qquad = 1632 \text{ cm}^2$ ---------- (1)

$\quad$ b) Cost = 1632×0.6 ---------- (1)

$\qquad\qquad = \$979.2$

$\qquad\qquad = \$979$ (nearest dollar) ---------- (1)

$\quad$ c) Volume = $\dfrac{1}{2}\times(15+12)\times 14\times 22$ ---------- (1)

$\qquad\qquad\quad = 4158 \text{ cm}^3$ ---------- (1)

$\quad$ d) $4158=\dfrac{22}{7}\times r^2\times 27$ ---------- (1)

$\qquad r^2=49$ ---------- (1)

$\qquad r=7$ ---------- (1)

13 ai) August ---------- (1)

$\dfrac{50}{500} \times 100\% = 10\%$ ---------- (1)

aii) First 3 months = 400 + 500 + 450 = 1350
Last 3 months = 600 = 800 + 1000 = 2400 ⎫ ---------- (1)

Ratio = 1350:2400
= 9:16 ---------- (1)

bi) Let no. of fruit tarts be $x + 48$ ---------- (1)

$\dfrac{1}{6}(x + 48) + \dfrac{1}{4}x = 33$ ---------- (1)

$2x + 96 + 3x = 396$ ---------- (1)

$x = 60$ ---------- (1)

bii) Fruit tarts = 60 + 48 = 108

$\dfrac{5}{6} \times 108 = 90$ fruit tarts were eaten.

$\dfrac{3}{4} \times 60 = 45$ egg tarts were eaten.

Fraction $= \dfrac{90}{90 + 45}$ ---------- (1)

$= \dfrac{90}{135}$

$= \dfrac{2}{3}$ ---------- (1)