南 华 中 学
NAN HUA HIGH SCHOOL

END-OF-YEAR EXAMINATION 2006

Subject	:	**Mathematics**
Paper	:	**Part 1**
Level	:	**Sec One Express/ Special**
Date	:	**4 Oct 2006**
Duration	:	**1 hour**

INSTRUCTIONS TO CANDIDATES

1. Write your name, index number and class in the spaces provided at the top of this page.
2. Answer **all** questions
3. Write your answers in the spaces provided in the question paper.
4. All essential working must be shown clearly in the spaces provided.
    Omission of essential working will result in loss of marks
5. The use of an electronic calculator is <u>not</u> allowed.

The number of marks is given in brackets [ ] at the end of each question or part of a question. You should not spend too much time on any one question.

The total marks for this paper is 50.

1. x is a prime number such that $x \geq 11$ and $x < 23$. Draw a number line to show clearly all possible values of x.

[2]

2.   (a)   Express $\dfrac{5}{21}$ as a decimal, correct to 2 significant figures.

(b)   Convert 0.328 into a fraction. Express your answer in the simplest form.

Answer: (a) _____ [2]

(b) _____ [2]

3. Find the HCF of
    (a) 63 and 819
    (b) 36, 108 and 432
    and give each answer as a product of prime factors in index notation.

    Answer: (a) _____ [2]

    (b) _____ [2]

4. Find the LCM of 3, 6, 16 and 20.

    Answer: _____ [2]

5. Find the value of

    (a) $1.5 + 2 \times (-1.2)^2$
    (b) $[\, 3 \times (5 - 2)\,] - 100 \div 20 \times 3$

    Answer: (a)_____ [2]

    (b)_____ [2]

6. Evaluate $\left(1\frac{1}{5}\right)^2 - \left(7\frac{4}{5} - 8\frac{3}{5}\right)^2$

    Answer: _____ [3]

7. Using as much of the information given as possible, find the value of $\sqrt{4720}$.
   $[\sqrt{4.72} = 2.17, \sqrt{47.2} = 6.87]$

Answer: _____ [2]

8.(a) Evaluate (i) $\sqrt[3]{512}$
        (ii) $\sqrt[3]{1331}$

   (b) Hence or otherwise, find the value of $\sqrt[3]{\dfrac{512}{1331}}$

Answer: (a)(i)_____ [2]

(ii)_____ [2]

(b) _____ [2]

9.   Evaluate

(a) $899.2 \div 0.028$, (i) correct to the nearest 100
                                (ii) correct to the nearest 10,000

(b) 0.321×0.21, (i) correct to 2 decimal places
                                (ii) correct to 3 significant figures

Answer: (a)(i)_____ [2]

(a)(ii)_____ [1]

(b)(i)_____ [2]

(b)(ii)_____ [1]

10. Solve the following equations:

    a. $\dfrac{2x}{5} - \dfrac{2x-1}{3} = \dfrac{3}{10}$

    b. $6 - [x - (2x - 4) - 1] = 0$

    c. $\dfrac{1}{2}\left(\dfrac{x}{3} - 8\right) = \dfrac{x}{2} - 3$

Answer (a) _____ [2]

            (b) _____ [2]

            (c) _____ [2]

11. The ratio of the number of stamps Jane has to that which Adi has is 3 : 4.

The ratio of the number of stamps Adi has to that which Demi has is 5 : 6.

If Jane and Adi together have 595 stamps, how many stamps does Demi have?

Ans: _____ [3]

12. John took $4\frac{1}{2}$ hours to cycle from Town A to Town B at a constant speed x km/h. If he increased his speed by 3 km/h, he would have taken 45 minutes less.

(a) Find x.
(b) Find the distance between Towns A and B.

Answer (a) $x =$ _____ [3]

(b) _____ [1]

13. Figure 2 is obtained by placing tiles at the corners of the tile in Figure 1. Figure 3 is obtained by placing tiles at the corners of the tiles in Figure 2. This process is repeated.

a) Complete Figure 4 on the diagram below.

Figure 1

Figure 2

Figure 3

Figure 4

[1]
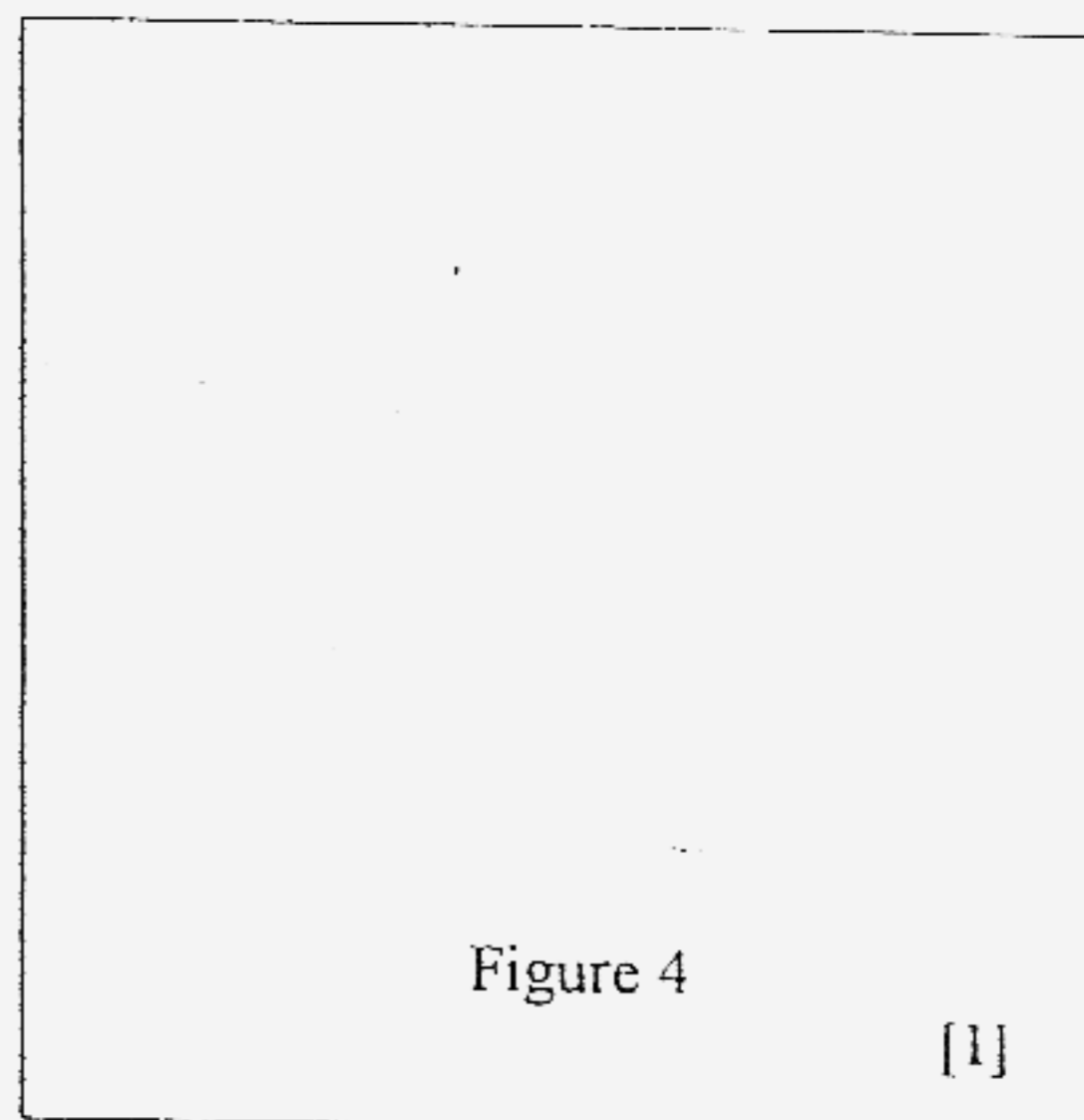
b) Complete the following table [3]

Figure	Total Number of tiles
1	$1 = 1$
2	$1 + 4 = 5$
3	$1 + 4 + 8 = 13$
4	
5	
6	

Name: _____ ( ) Class: Sec _____

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END-OF-YEAR EXAMINATION 2006

Subject	:	Mathematics
Paper	:	Part 2
Level	:	Sec One Express/ Special
Date	:	4 Oct 2006
Duration	:	1 hour 15 min

INSTRUCTIONS TO CANDIDATES

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2. Answer **all** questions
3. Write your answers in the spaces provided in the question paper.
4. All essential working must be shown clearly in the spaces provided. Omission of essential working will result in loss of marks
5. The use of an electronic calculator is expected where appropriate.
6. If the degree of accuracy is not specified and if the answer is not exact, give the answer correct to three significant figures. Give answers in degrees to one decimal place.

The number of marks is given in brackets [ ] at the end of each question or part of a question. You should not spend too much time on any one question.

The total marks for this paper is 50.

1. Simplify the following expression

(a) $\dfrac{4p}{9} \times \dfrac{p^3 q^2}{2q} \div \dfrac{p}{3q^2}$

(b) $-4m - [3m - 2(3m+3) - 6] \div 2$

Answer   (a)_____ [2]

(b)_____ [2]

2. Given that $u = \dfrac{v^2 + 4}{5}$

    (a) find the value of u when $v = 3$,

    (b) find the positive value of v when $u = 8$
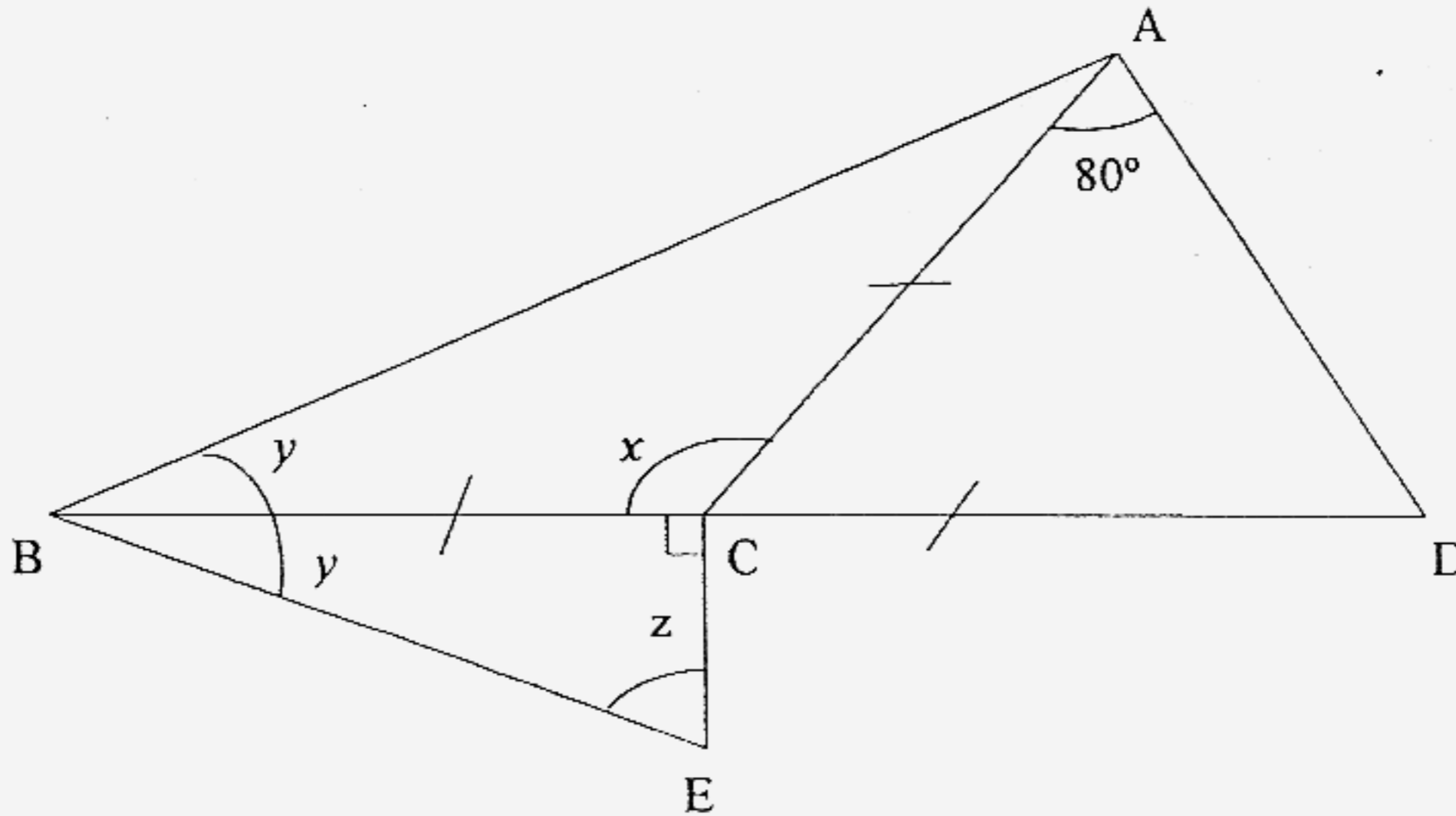
Answer: (a) _____ [2]

(b) _____ [2]

3. Mr Yeo is 3 years older than his wife. His son's age is $\dfrac{1}{4}$ of his age. His daughter's age is $\dfrac{1}{3}$ of his wife's age. If the sum of his age and his son's age is the same as the sum of his wife's age and his daughter's age, calculate Mr Yeo's present age.

Answer: _____ [4]

4. Subtract $(2x^2 + 7x - 13)$ from the sum of $(17x^2 - 12x + 1)$ and $(x^2 + 19)$.

Answer: _____ [3]

5.   Given that BCD is a straight line, BC = AC = CD and $\angle CAD = 80°$. Find the values of x, of y and of z.



Answer: (i)   x=_____ [2]

(ii) y=_____ [2]

(iii) z=_____ [1]

6.   A solid cylinder is made from plastic. The height and diameter of the cylinder measured are 16 cm and 15 cm respectively.

(a)   Calculate the volume of plastic needed to make the cylinder (shown below). (Take $\pi = 3.14$).

(b)   Ten such cylinders are melted to make cubes whose side is 3 mm each. What is the maximum number of cubes that can be made from the cylinders?

16 cm

15 cm
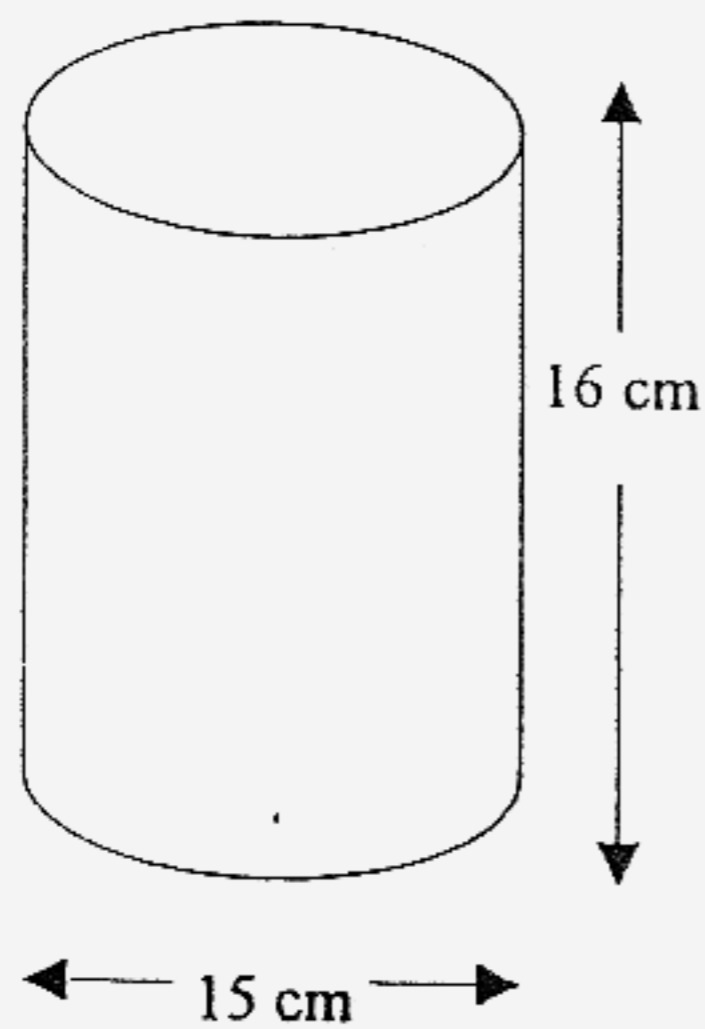
Answer: (a) _____ [2]

(b) _____ [3]

7. The figure shows a rectangular plot of land, $4x$ metres(m) long and $2x$ metres(m) wide. There is a border round a rectangular garden in it as shown.
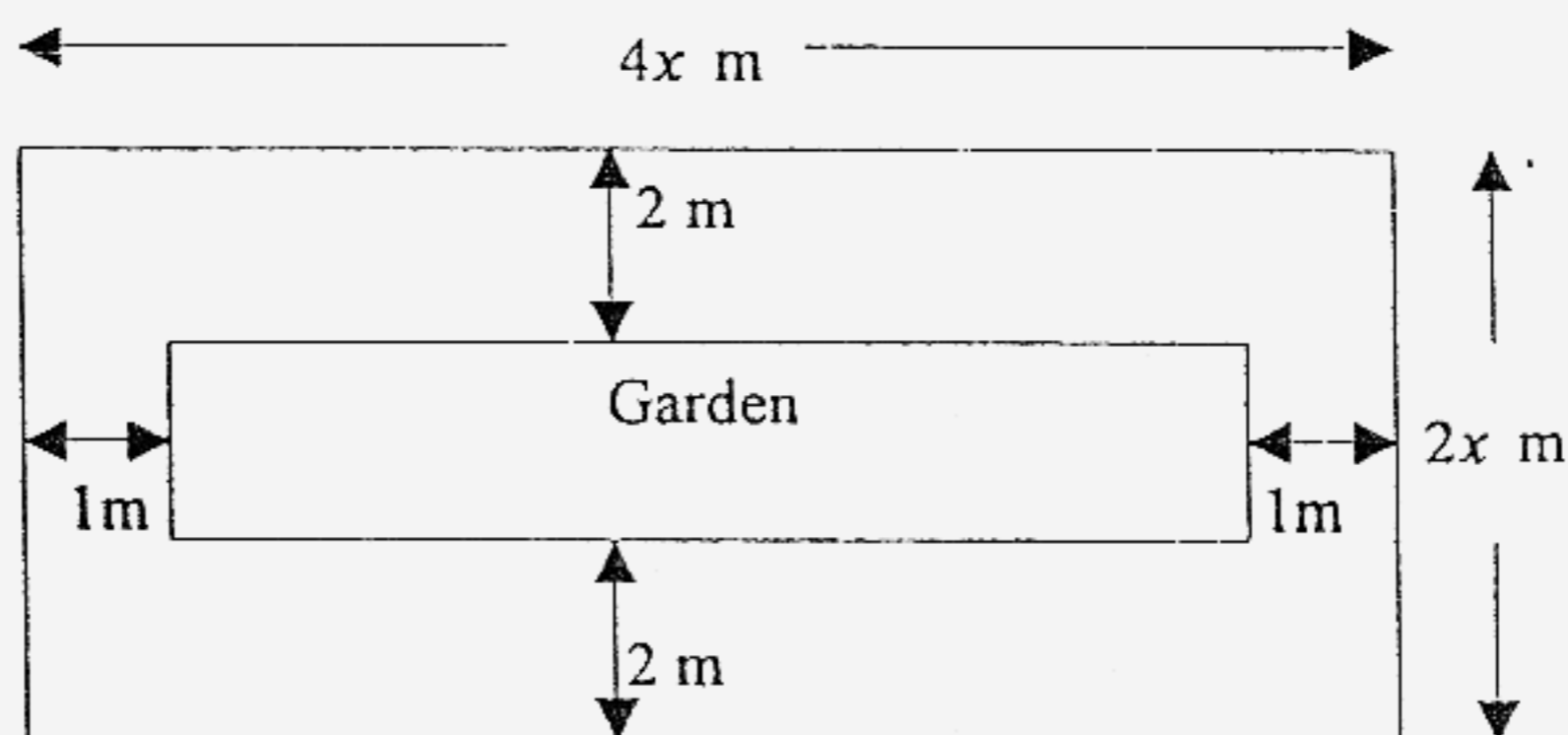

Write an expression in terms of x for

    (i) the perimeter of the garden
    (ii) the area of the garden

If $x = 15$, find

    (iii) the area,
    (iv) the perimeter of the garden

Answer:(i)   _____ [2]

      (ii)   _____ [2]

      (iii)   _____ [1]

      (iv)   _____ [1]

8. A swimming pool, 45 m long and 20 m wide, is 4.5 m deep at one end and 1.5 m deep at the other end. The floor of the pool slopes uniformly. Find the volume of water when the swimming pool is filled. (A cross-section of the pool is shown below.)
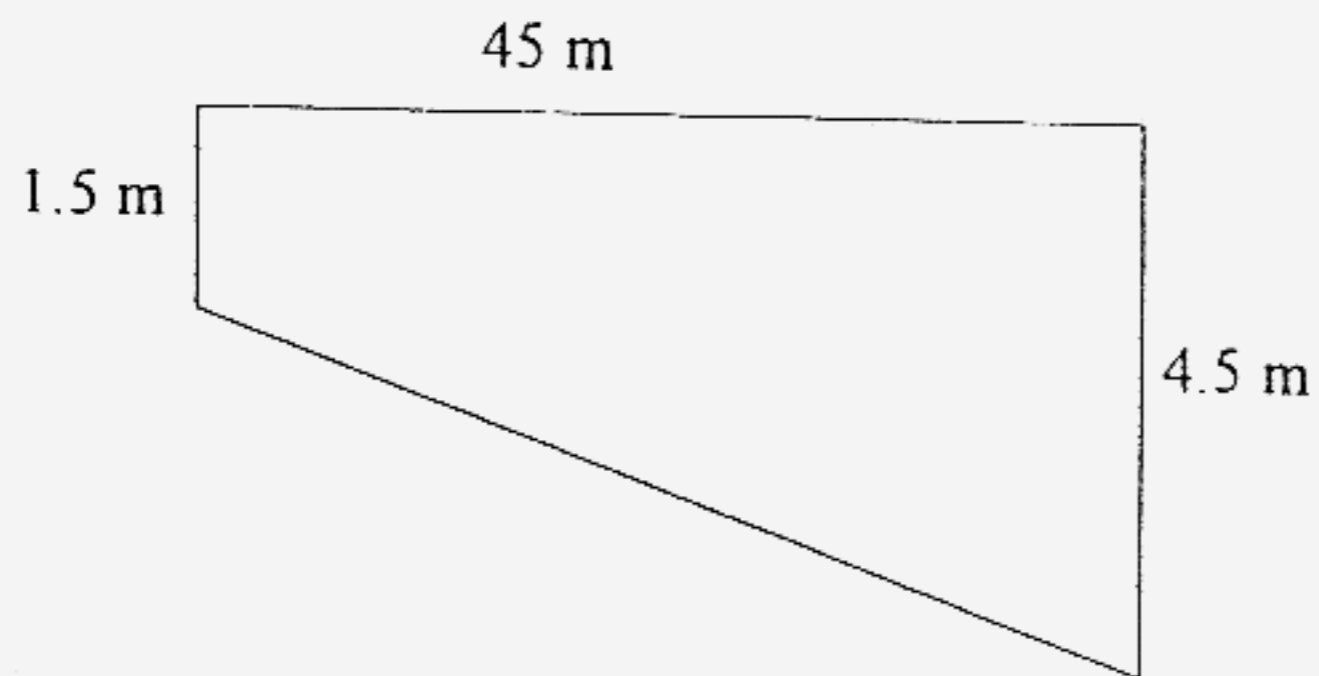
Answer: _____ [3]

9. A circle has a circumference of 40 cm and a square has a perimeter of 40 cm. Determine which shape has the bigger area? Take $\pi = 3$.

Answer: _____ [5]

10. Ali wanted to calculate the area of a rectangular piece of land measuring 24.25 m by 19.88 m. He found out that the multiplication key on his calculator is out of order. After thinking for a few minutes, she came up with a method to calculate the area using the division key rather than the multiplication key:

$$\text{Area} = [1 \div (1 \div 24.25 \div 19.88)]m^2$$

$$= 482.09 \text{ m}^2$$

Explain why Ali's method worked.

Answer: _____ [3]

11(a) Sam has a MP3 player which he stored a total of 490 songs. The MP3 player has a number of English, Mandarin and Cantonese pop songs. 50% of the total is Mandarin, $\frac{1}{7}$ of the total is Cantonese, while the rest is English pop songs. Find the ratio of

i) English pop to Cantonese pop

ii) Cantonese pop to Mandarin pop

iii) English pop to Mandarin pop

Answer: (i)_____ [2]

(ii)_____ [1]

(iii)_____ [1]

11(b) The total running time (playing songs) of the MP3 player is 34 hours 42 minutes and 30 seconds. 40% of the total running time belongs to the English pop, and Mandarin pop takes up 4 times as much as Cantonese pop. Calculate the total timing for

i) English pop

ii) Mandarin pop

(Leave your answers in minutes and seconds)

(i) _____ [2]

(ii)_____ [2]

Answers:

1. 11, 13, 17, 19

2(a) 0.24

  (b) $\dfrac{41}{125}$

3(a) $3^2 \times 7$

  (b) $2^2 \times 3^2$

4. 240

5(a) 4.38

  (b) -6

6. $\dfrac{4}{5}$

7. 68.7

8(a)(i) 8

  (ii) 11

  (b) $-\dfrac{8}{11}$

9(a)(i) 32 100

  (ii) 30 000

  (b)(i) 0.07

  (ii) 0.0674

10(a) $\dfrac{1}{8}$

  (b) -3

  (c) -3

11.   408

12(a)   15

   (b)   67.5 km

13(b)   25, 41, 61

Answers:

1(a) $\dfrac{2}{3}p^3q^3$

  (b) $6-\dfrac{5}{2}m$

2(a) $2\dfrac{3}{5}$

  (b) 6

3. 48

4. $16x^2-19x+33$

5(i) $160°$

  (ii) $10°$

  (iii) $80°$

6(a) 2826 cm^3

  (b) 1 046 666 cubes

7(i) $12(x-1)m$

  (ii) $4(2x-1)(x-2)m^2$

  (iii) $1508m^2$

  (iv) $168m$

8. $2700m^3$

9. circle

10. use concept of reciprocity

11(a)(i) 5:2

   (ii) 2:7

   (iii) 5:7

(b)(i) 833 mins

   (ii) 999mins 36secs