MATHEMATICS

Name and Surname: _____   Index number: _____

Answer all questions. Any working must be shown on this paper

SECTION A: Each question in this section carries 4 marks.

1. Write the following in index form as a <u>single number</u>

   (a) $(6^2)^5$ = _____   (b) $y^{-3} \times y^5$ = _____

   (c) $7^6 \div 7^4$ = _____   (d) $r^8 \div r^0$ = _____

2.   Correct each of the following numbers to 2 decimal places

   (a) 7.856 = _____   (b) 212.4 = _____

   Correct each of the following numbers to 3 significant figures.

   (c) 0.03845 = _____   (d) $21\ 547$ = _____

3.   (a) Write the following numbers in ascending order

   $\frac{3}{5}, 0.78, \frac{5}{7}, 0.7$

   (b) Express

   (i) $\frac{3}{8}$:   as a decimal: _____   as a percentage: _____

   (ii) 0.81: as a fraction: _____   as a percentage: _____

4. (a) Write down two decimal numbers for x which satisfy the following inequality

$$\frac{1}{4} < x < \frac{1}{3}$$

(b) The mass of a bucket of sand is 2.3 kg correct to 1 decimal place. Write down the range in which the actual weight, w kg, of the bucket may lie.

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5. (a) Write the following in standard form

(i) 2783 = _____   (ii) 0.000856 = _____

(b) Evaluate the following

(i) $\left(\frac{1}{8}\right)^{-2} =$ _____   (ii) $\left(\frac{7}{10}\right)^{3} =$ _____

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6. Expand the following

(i) $3(x - 7)$

(ii) $2(x + 7) + (x - 3)$

(iii) $5(x + 3) - (x - 1)^2$

SECTION B: Each question in this section carries 6 marks

1. (a) The sum of 35,000 leke is to be given as a bonus to three employees –
   Jack, Mary and Ben.

   Jack received the least amount
   Mary is to receive double Jack's amount
   Ben is to receive double Mary's amount

   Let x (leke) be the amount to be given to Jack.

   Write down, in terms of x, express the amount that is to be given to

   (i)   *Mary*
   (ii) *Ben*

   (iii) Calculate the amount of money which Jack will be given.

   (b) Solve the following equation:

   $$8(p - 3) = 2(3p - 5) + 2$$

2. (a) Cheesecakes cost 60 leke each and sausage rolls cost 120 leke each.

   Philip buys x cheesecakes and y sausage rolls and he spends altogether
   780 leke.

   (i) Write down an equation using x and y

   (ii) If he buys 3 cheesecakes, how many sausage rolls did he buy?

   (iii) If he buys 1 sausage roll, how many cheesecakes did he buy?

   (b) In the following equations write r as the subject of the formula.

   (i) $a + br = p$ (ii) $\dfrac{2m}{r} = n$

3. (a) In December 2004, the price of a washing machine was 24,000 leke.

In January 2005, this price was decreased by 20%.

In March 2005, the price of the washing machine (the January price) was increased by 20%

Work out the final price of the washing machine.

(b) Mr. Borg works part-time as a waiter in a hotel. He is paid at the rate of 225 leke per hour and is taxed at 15%.

Find the tax payable on the part-time job during a week when he worked for 25 hours.

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4. The length of a rectangle is x cm and its width is y cm.

(a) If the perimeter is 17 cm, write down an equation for the perimeter of the rectangle in terms of x and y.

(b) If I add three times the length with four times the width the sum is 28 cm. Write down an equation using this information.

(c) Using the two equations above, find the length and width of the rectangle.
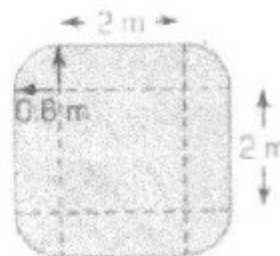
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5. Solve the following inequalities

(a) $7x + 1 \le 13 + 3x$, and illustrate your answer on a number line.

(b) $4x - 1 \le 5x < 8x + 9$ and write down the range of values for x which satisfies the inequality

SECTION C: Each question in this section carries 8 marks

1. (a) Find the area, to 1 d.p., of the square on the right with rounded corners.

   (b) The two parallelograms below are identical. The area of triangle ABE in Figure 2a is equal to the area of the triangle ABC in Figure 2b. Briefly explain why this is true.
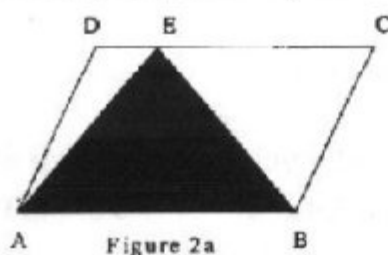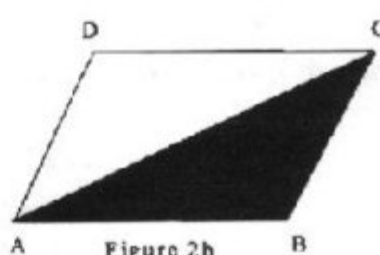

Figure 2a   Figure 2b

   (c) The radius of a cylinder is 30 mm and its height is 7 cm, find its volume in cm^3. (Give answer correct to 1 d.p.)

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2. The line with equation $4x + 5y = 20$ cuts the x-axis at A and the y-axis at B.

   (i) Find the coordinates of point A and point B

   (ii) Does the point $(2\frac{1}{2}, 2)$ lie on this line?

   (iii) Using the two points A and B, draw the line on the graph paper provided.

   (iv) Calculate the gradient of the line.

   (v) Write down the equation of the line which is parallel to $4x + 5y = 20$ and passes through the origin.

3. (a) The figure below shows a cyclic quadrilateral ABCD, in which AB = AD and BC = CD. Also, $B\hat{C}D = 100°$.

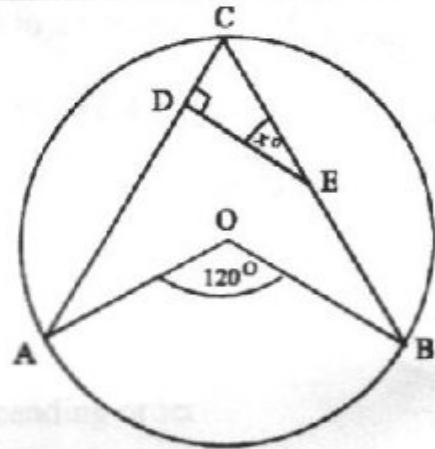   *Work out the following and give reasons for your answers*

   (i) $D\hat{A}B$

   (ii) $A\hat{B}D$
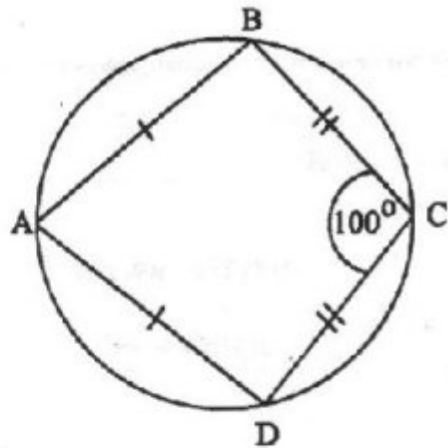
   (iii) If the angle $A\hat{B}C$ is 90^0, explain why AC is a diameter.

   (b) In the diagram below, the circle has centre, O.
   If angle $C\hat{D}E = 90°$ and angle $A\hat{O}B = 120°$.

   Find the angle marked x and give reasons for your answer.

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4. Factorise the following completely

   (a) $3ab + 6ac - 18ad$

   (b) $p^2 - 12p + 20$

   (c) $15x^2 + x - 6$

   (d) $4x^2 - 49y^2$

   (e) $4x^2 - 2x - 6$