Dear children,

The long awaited summer vacation is here. Summer is a time to relax, be productive and to get ahead. As important as it is to rest & enjoy, it is also important to continue to learn. Strike a balance between work and play and allow yourself to grow in the process. You can spend your time as you wish but make sure that along with enjoying and relaxing make this summer a time to learn new things, exploring the opportunities available. To enhance your learning we have planned enjoyable activities to keep your skills sharp and concepts clear. Use your energy and give a vent to your creativity. It will surely enhance your learning process. Relax, enjoy, have loads of fun and come back refreshed.

Ms Mahvash Roshani
Principal

See you on Monday, 01st August, 2016.
Dawood Public School
Summer Vacation Homework
2016-17
Class X

Name: ___________________________ Date: _______________
Class: ___________ Section: ___________

- Submission of completed homework to the class teacher of Class III by Monday, August 8th, 2016 is compulsory.
- Maintain a daily diary and record your activities accordingly.

Note: Make a neat folder for each subject and put your homework in it.
Q.1 Fatima and Mohammad each buy a bike.

(a) Fatima buys a city-bike has a price of $120. She pays 60% of this price and then pays $10 per month for 6 months.
   (i) How much does Fatima pay altogether?
   (ii) Work out your answer to part (a)(i) as a percentage of the original price of $120.

(b) Mohammad pays $159.10 for a mountain-bike in a sale. The original price had been reduced by 14%. Calculate the original price of the mountain-bike.

(c) Mohammad’s height is 169 cm and Fatima’s height is 156 cm. The frame sizes of their bikes are in the same ratio as their heights. The frame size of Mohammad’s bike is 52 cm. Calculate the frame size of Fatima’s bike.

(d) Fatima and Mohammad are members of a school team which takes part in a bike ride for charity.
   (i) Fatima and Mohammad ride a total distance of 36 km. The ratio distance Fatima rides: distance Mohammad rides is 11:9. Work out the distance Fatima rides.
   (ii) The distance of 36 km is only 2/23 of the total distance the team rides. Calculate this total distance.

Q.2

The diagram shows a solid made up of a hemisphere and a cone. The base radius of the cone and the radius of the hemisphere are each 7 cm. The height of the cone is 13 cm.
(a) (i) Calculate the total volume of the solid.
   \[ \text{[The volume of a hemisphere of radius } r \text{ is given by } V = \frac{2}{3} \pi r^3 .] \]
   \[ \text{[The volume of a cone of radius } r \text{ and height } h \text{ is given by } V = \frac{1}{3} \pi r^2 h .] \]
   (ii) The solid is made of wood and 1 cm\(^3\) of this wood has a mass of 0.94 g. Calculate the mass of the solid, in kilograms, correct to 1 decimal place.

(b) Calculate the curved surface area of the cone. The curved surface area of a cone of radius } r \text{ and sloping edge } l \text{ is given by } A = \pi rl.

(c) The cost of covering the entire solid with gold plate is $411.58. Calculate the cost of this gold plate per square centimeter. The curved surface area of the hemisphere is given by } A = 2\pi r^2 .

Q.3 Hassan sells fruits and vegetables at the market.

(a) The mass of fruit and vegetables he sells is in the ratio
   Fruit: vegetables = 5:7.
   Hassan sells 1.33 tonnes of vegetables. How many kilograms of fruit does he sell?

(b) The amount of money Hassan receives from selling fruit and vegetables is in the ratio
   Fruit: vegetables = 9:8.
   Hassan receives a total of $765 from selling fruit and vegetables. Calculate how much Hassan receives from selling fruit.

(c) Calculate the average price of Hassan’s fruit, in dollars per kilogram.

(d) (i) Hassan sells oranges for $0.35 per kilogram. He reduces this price by 40%. Calculate the new price per kilogram.
   (ii) The price of $0.35 per kilogram of oranges is an increase of 25% on the previous day’s price. Calculate the previous day’s price.

Q.4

The diagram shows a trapezium ABCD.
AB = 12 cm, DC = 9 cm and the perpendicular distance between these parallel sides is 7 cm. AD = BC.

(a) Approximately halfway down your page, draw a line AB of length 12 cm.
(b) Using a straight edge and compasses only, construct the perpendicular bisector of AB.
(c) Complete an accurate drawing of the trapezium ABCD.
(d) **Measure** angle ABC, giving your answer correct to the nearest degree.

(e) Use trigonometry to calculate angle ABC. Show all your working and give your answer correct to 1 decimal place.

(f) On your diagram,
   (i) Draw the locus of points inside the trapezium which are 5 cm from D.
   (ii) Using a straight edge and compasses only, construct the locus of points equidistant from DA and from DC,
   (iii) Shade the region inside the trapezium containing points which are less than 5 cm from D and nearer to DA than to DC.

Q.5 The length, y, of a solid is inversely proportional to the square of its height, x.

(i) Write down a general equation for x and y. Show that when x = 5 and y = 4.8 the equation becomes \( x^2 y = 120 \).

(ii) Find y when x = 2.

(iii) Find x when y = 10.

(iv) Find x when y = x.

(v) Describe exactly what happens to y when x is doubled.

(vi) Describe exactly what happens to x when y is decreased by 36%.

(vii) Make x the subject of the formula \( x^2 y = 120 \).

Q.6

Diagram 1 shows a closed box. The box is a prism of length 40 cm.
The cross-section of the box is shown in Diagram 2, with all the right-angles marked.
AB is an arc of a circle; Centre O, radius 12 cm.
ED = 22 cm and DC = 18 cm.

Calculate

(a) The perimeter of the cross-section.

(b) The area of the cross-section.

(c) The volume of the box.

(d) The total surface area of the box.
Q.7

The diagram shows a pyramid on a horizontal rectangular base ABCD.
The diagonals of ABCD meet at E.
P is vertically above E.
AB = 8 cm, BC = 6 cm and PC = 13 cm.

(a) Calculate PE, the height of the pyramid.
(b) Calculate the volume of the pyramid.

[The volume of a pyramid is given by $\frac{1}{3} \times \text{area of base} \times \text{height}$.]

(c) Calculate angle PCA.
(d) M is the mid-point of AD and N is the mid-point of BC.
(e) (i) Calculate angle MPN.

(ii) Kline on PB so that BK = 4 cm.

Calculate the length of KC.
Q.8

(a) The diagram shows a trapezium.
Two of its angles are 90°.
The lengths of the sides are given in terms of x.
The perimeter is 62 units.
i. Write down a quadratic equation in x to show this information. Simplify your equation.
ii. Solve your quadratic equation.
iii. Write down the only possible value of x.
iv. Calculate the area of the trapezium.

(b) The diagram shows a right-angled triangle.
The lengths of the sides are given in terms of y.
i. Show that $2y^2 - 8y - 3 = 0$.
ii. Solve the equation $2y^2 - 8y - 3 = 0$, giving your answers to 2 decimal places.
iii. Calculate the area of the triangle.

Q.9 (a) The scale of a map is 1:20 000 000.
On the map, the distance between Cairo and Addis Ababa is 12 cm.
(i) Calculate the distance in kilometers, between Cairo and Addis Ababa.
(ii) On the map the area of a desert region is 13 square centimeters.
Calculate the actual area of this desert region, in square kilometers.

(b) (i) The actual distance between Cairo and Khartoum is 1580km. On a different map this distance is represented by 31.6cm. Calculate, in the form 1:n, the scale of this map.
(ii) A plane flies the 1580km from Cairo to Khartoum. It departs from Cairo at 11:55 and arrives in Khartoum at 1403.
Calculate the average speed of the plane, in kilometers per hour.
Q.10 A packet of sweets contains chocolate and toffees.

(a) There are \( x \) chocolates which have a total mass of 105 grams. Write down, in terms of \( x \), the mean mass of a chocolate.

(b) There are \( x + 4 \) Toffees, which have a total mass of 105 grams. Write down, in terms of \( x \), the mean mass of a toffee.

(c) The difference between the two mean masses in part (a) and (b) is 0.8 grams. Write down an equation in \( x \), and show that it simplifies to \( x^2 + 4x - 525 = 0 \).

(d) (i) Factorize \( x^2 + 4x - 525 \).

(ii) Write down the solutions of \( x^2 + 4x - 525 = 0 \).

(e) Write down the total number of sweets in the packet.

(f) Find the mean mass of a sweet in the packet.

Q.11 (a) (i) Factorize \( x^2 - x - 20 \).

(ii) Solve the equation \( x^2 - x - 20 = 0 \).

(b) Solve the equation \( 3x^2 - 2x - 2 = 0 \). Show all your working, and give your answers correct to 2 decimal places.

(c) \( y = m^2 - 4n^2 \).

(i) Factorize \( m^2 - 4n^2 \).

(ii) Find the value of \( x \) when \( m = 4.4 \) and \( n = 2.8 \).

(iii) \( m = 2x + 3 \) and \( n = x - 1 \).

Find \( y \) in terms of \( x \), in its simplest form.

(iv) Make the subject of formula \( y = m^2 - 4n^2 \).

(d) (i) \( m^4 - 16n^4 \) can be written as \( (m^2 - kn^2)(m^2 + kn^2) \).

Write down the value of \( k \).

(ii) Factorize completely \( m^4n^4 - 16n^8 \).

Q.12 (a) \( p \) varies inversely as \( (m + 1) \). When \( p = 4 \), \( m = 8 \).

Find the value of \( p \) when \( m = 11 \).

(b) (i) Factorize \( x^2 - 25 \).

(ii) Simplify \( \frac{2x^2 + 11x + 5}{x^2 - 25} \).

(c) Solve the inequality \( 5(x - 4) < 3(12 - x) \).

Q.13 A spherical ball has a radius of 2.4 cm.

(a) Show that the volume of the ball is 57.9 cm\(^3\). Correct to 3 significant figures.

[The volume \( V \) of a sphere of radius \( r \) is \( V = \frac{4}{3} \pi r^3 \).]
(b) Six spherical balls of radius 2.4 cm fit exactly into a closed box. The box is a cuboids. Find
(i) The length, width and height of the box.
(ii) The volume of the box.
(iii) The volume of the box not occupied by the balls.
(iv) The surface area of the box.

(c) The six balls can also fit exactly in to a closed cylindrical container, as shown in the diagram. Find
(i) The volume of the cylindrical container.
(ii) The volume of the cylindrical container not occupied by the balls.
(iii) The surface area of the cylindrical container.

Q.14

In the diagram, ABCDEF is a prism of length 36 cm. The cross-section ABC is a right-angled triangle. AB = 19 cm and AC = 14 cm.

Calculate
(a) The length BC.
(b) The total surface area of the prism.
(c) The volume of the prism.
(d) The length CE.
(e) The angle between the line CE and the base ABED.
Q.15 Alberto and Maria share $240 in the ratio 3 : 5.

(a) Show that Alberto receives $90 and Maria receives $150.

Answer (a)

(b) (i) Alberto invests his $90 for 2 years at r % per year simple interest.

At the end of 2 years the amount of money he has is $99. Calculate the value of r.

(ii) The $99 is 60% of the cost of a holiday.

Calculate the cost of the holiday.

(c) Maria invests her $150 for 2 years at 4% per year compound interest.

Calculate the exact amount Maria has at the end of 2 years.

(d) Maria continues to invest her money at 4% per year compound interest.

After 20 years she has $328.67.

(i) Calculate exactly how much more this is than $150 invested for 20 years at 4% per year simple interest.

(ii) Calculate $328.67 as a percentage of $150.

Q.16 A bookshop sold a total of 2750 books in January.

(a) The ratio hardback books sold : paperback books sold was 4 : 7.

Calculate how many paperback books were sold.

(b) 24% of the 2750 books were non-fiction.

Calculate how many non-fiction books were sold.

(c) 330 cookery books were sold.

Write 330 as a fraction of 2750 in its lowest terms.

(d) In February, the bookshop sold 14% more than the 2750 books sold in January.

Calculate the number of books sold in February.

(e) The total value of the books sold in January was $9480 correct to the nearest 10 dollars.

Write down the lower bound for this amount.

(f) 35000 books were sold this year.

Write this number in standard form.

Q.17 In this question gives all your answers correct to 2 decimal places.

(a) A bank has an exchange rate of $1 = € 0.6513.

(i) Jonathan changes $500 into euros (€).

Calculate the amount Jonathan receives.

(ii) Arika changes €300 into dollars.

Calculate the amount arika receives.

(b) Dania borrows $325 for 2 years at a rate of 3.8% per year simple interest.

Calculate the total amount Dania owes after 2 years.

(c) Lee borrows $550 for 2 years at a rate of 6% per year compound interest.

Calculate the total amount Lee owes after 2 years.
Q.18
(a) (i) 1, 2 and 36 are factors of 36.
Write down all the other factors of 36.
(ii) 1 and 2 are common factors of 36 and 90.
Write down two more common factors of 36 and 90.
(b) Write down all the square numbers between 20 and 50.
(c) p and q are prime numbers.
\[p^3 \times q = 56\]
Find p and q.

Q.19 MrsSesay leaves home by car at 13 30. After 15 minutes she stops at a shopping centre, 8 kilometres from home.
(a) Calculate the average speed for her journey. Give your answer in kilometres per hour.
(b) She leaves the shopping centre half an hour later.
She travels a further 12 kilometres at the speed of 36 km/h to Villeneuve.
(i) Write down the time when she leaves the shopping centre.
(ii) Calculate the time, in minutes, that she takes to travel from the shopping centre to Villeneuve.
(iii) On the grid opposite, complete the travel graph showing her journey.
(c) Her son, Braima, also leaves home at 13 30 and cycles the 20 kilometres to Villeneuve. He cycles at a speed of 15 km/h.
(i) Calculate how long his journey takes. Give your answer in hours and minutes.
(ii) Show his journey on the grid.
(iii) How many minutes after his mother does Braima arrive at Villeneuve

Q.20
(a) Simplify the following expressions.
(i) \[5k + 3p - 2 + p - 2k - 5\]
(ii) \[5y^2 - 4x + 5x - 7y^2\]
(b) Expand the following expressions.
(i) \[3 \times (4 + 7g)\]
(ii) \[5m \times (5m^2 - t^2)\]
Q.21
The diagram shows a block of stone in the shape of a prism of length 42 cm.
The cross-section is a trapezium ABCD.
AB = 19 cm, AD = 10 cm, DC = 13 cm and angle ADC = 90°.

(a) Calculate
   (i) The perimeter of the rectangular face ABFE.
   (ii) The area of the cross-section ABCD.
   (iii) The volume of the block of stone.

(b) The mass of 1 cubic centimeter of the stone is 4 grams.
   Calculate the mass of the block.
   Give your answer in kilograms.

Q.22 In this question give all your answers to 2 decimal places.

(a) Ankuri lends her brother $275 for 4 years at a rate of 3.6% per year simple interest.
   Calculate the total amount her brother owes after 4 years.

(b) Monesh invests $650 in a bank which pays 4% per year compound interest. Calculate the amount Monesh will have after 2 years.

(c) Theresa and Ian have 400 euros (€) each.
   (i) Theresa changes her €400 for pounds (£) when the exchange rate is € = £ 0.7857.
       Calculate the amount she receives.
   (ii) Ian changes his €400 for dollars ($) when the exchange rate is $1 = € 0.6374.

Q.23

(a) The cost of a bottle of water is $w.
The cost of a bottle of juice is $j.
The total cost of 8 bottles of water and 2 bottles of juice is $12.
The total cost of 12 bottles of water and 18 bottles of juice is $45.
Find the cost of a bottle of water and the cost of a bottle of juice.

(b) Roshni cycles 2 kilometers at y km/h and then runs 4 kilometers at (y − 4) km/h. The whole journey takes 40 minutes.

   (i) Write an equation in y and show that it simplifies to \( y^2 - 13y + 12 = 0 \).
   (ii) Factorise \( y^2 - 13y + 12 \).
   (iii) Solve the equation \( y^2 - 13y + 12 = 0 \).
   (iv) Work out Roshni’s running speed.

(c) Solve the equation \( u^2 - u - 4 = 0 \).
   Show all your working and give your answers correct to 2 decimal places.

Q.24 Daniella is 8 years old and Edward is 12 years old.

(a) Their parents give them some money in the ratio of their ages.

   (i) Write the ratio Daniella’s: Edward’s age in its simplest form.

   (ii) Daniella receives $30.
       Show that Edward receives $45.
   (iii) What percentage of the total amount of money given by their parents does Edward receive?
(b) Daniella invests her $30 at 3% per year, compound interest.
   Calculate the amount Daniella has after 2 years.
   Give your answer correct to 2 decimal places.

(c) Edward also invests $30
   He invests this money at a rate of r% per year, simple interest.
   After 5 years he has a total amount of $32.25.
   Calculate the value of r.

Q.25
(a) An electrician is paid a fixed amount of $12 and then $6.50 for each hour she works.
   (i) The electrician works for 7 hours.
       Calculate how much she is paid for this work.
   (ii) The electrician works for n hours.
       Write down an expression, in terms of n, for how much she is paid.
   (iii) The electrician is paid $44.50 for her work.
       Calculate the number of hours she worked.

(b) Solve the simultaneous equations.
   
   $3x - y = 22$
   $5x + 3y = 4$

ENGLISH

Task I

Novels to be read in vacation:
1. The Kite Runner by Khaled Hosseini
2. Flowers for Algernon by Charlie Gordon

Write an essay on, ‘The Kite Runner’.
- Explore the theme of atonement:
- Identify stages of Amir's redemption
- Determine whether he has redeemed himself for the sins he committed against Hassan.
- Select the three steps you feel were the most meaningful to Amir.
- Use "Bubble Mapping".

Task II

Write a five-paragraph essay with an introduction and conclusion in response to one of the following questions:

1. How is science presented in Flowers for Algernon?
2. How is intelligence presented in Flowers for Algernon?
3. How are women presented in Flowers for Algernon?

Your essay should show thoughtful reading and attention to the essay-writing skills you have been building so far this year, particularly strong topic and summary sentences, solid quote sandwiches and consistent verb tenses.
Students of upcoming class X, need to do research work during vacation and have to submit a review report in the beginning of the term.

- **Review Report**: Read every Monday’s Dawn “BUSINESS & FINANCE”, Page “AGRIBUSINESS”. Collect news clippings and articles date wise from the same and make a scrap book. Write a review report on each article.