Unit 1

Sets

Review Worksheet

I. Choose the correct option for the following statements.

i. _____is the subset of every set.

A. Universal set **B.** Null set

C. Finite set **D.** Singleton set

ii. _____ sets have no elements common

A. Proper **B.** Finite

C. Disjoint **D.** Overlapping

iii. Elements that are in the universal set but not in the set A, are members of the set called _____of A.

A. subset **B.** proper subset

C. complement **D.** disjoint

iv. The set of elements which are in A, or in B, or in both A and B is called _____.

A. union **B.** intersection

C. complement **D.** subset

v. It is given that A = {3, 5, 7} and B = {I, 2, 3, 4, 5} then A ∩ B is equal to _____.

A. {3, 7} **B.** {2, 5}

C. {5, 7} **D.** {3, 5}

2. It is given that U = {3, 4, 5, 6, 7, 8, 9, I0}, A = {3, 4, 6, I2}, and B = {4, 6, 8, I0}, find

a. A'	**b.** $A \cap B$
c. $A \cup B$	**d.** B'

3. List all the subsets of {a, b, c}.

4. if U = {3, 4, 5, 6, 7, 8, 9}, A = {4, 5, 6}, B = {3, 5, 7}, C = {4, 9}

a. List the elements of

i. B

ii. A ∩ B

iii. A ∪ B

iv. A'

v. the complement of B

vi. $A' \cap B$

vii. $(A \cap B')$

viii. $B \cap C$.

ix. $A \cup C$.

5. It is given tht A = {10, 20, 30, 40}, B = {11, 13, 17, 19}, C = {10, 11, 12, 13} D = {11, 13}

a. D is a subset of two of the sets. Which are the two sets?

b. Find $A \cap B$

6. List all proper subsets of the following sets.

a. X = {g, h}

b. Y = {5, 7, 9}

c. Z = {Ali, Amna}

7. If U = {cat, dog, lion, monkey, duck}, A = {cat, dog, lion} and B = {cat, monkey, dog, duck}

a. Find A ∪ B and represent the intersection through Venn diagram.

b. Find A ∩ B and represent the intersection through Venn diagram.

c. Find $(A \cup B)'$ and $A' \cap B'$. Verify $(A \cup B)' = A' \cap B'$.

8. Identify disjoint and overlapping sets, from the following and represal using Venn diagram.

a. A = {3, 6, 9, 12} and B = {6, 8, 9}

b. C = {a, b, x, y} and D = {m, n, o, p}

c. E = {monkey, goat, lion} and F = {tiger, goat}

d. G = {q, r, s, t} and H = {u, v, w, x, y, z}

e. A = {S, U, N} B = {S, T, A, R}

f. C = {factors of 24} D = {factors of 33}

9. If U = {1, 2, 3, 4, 5, 6, 7, 8, 9} A = {1, 2} and B = {1, 2, 3, 4},
draw a Venn diagram to represent the above sets and to illustrate their relationship.

10. Find A – B and B – A if

a. A = {a, e, i, o, u}
B = {a, b, c, d, e, f}

b. A = {1, 3, 5, 7,...}
B = {2, 4, 6,...}

c. A = Set of integers
B = Set of whole numbers

d. A = {x, y, z}
B = { }

Unit 2

Rational Numbers

Review Worksheet

1. Choose the correct option.

i. The numbers that can be represented as a ratio of two integers, where the denominator is not equal to zero are called _____.

A. neutral **B.** prime numbers

C. even numbers **D.** rational numbers

ii. $8 - [-6 - (-10)] =$ _____.

A. 4 **B.** −8

C. 12 **D.** −4

iii. Multiplication inverse of $-\frac{37}{80}$ is _____.

A. $+\frac{37}{80}$ **B.** $\frac{80}{37}$

C. $-\frac{80}{37}$ **D.** +1

iv. Absolute value of $-\frac{25}{52}$ is _____.

A. $\frac{25}{52}$ **B.** $-\frac{25}{52}$

C. $\frac{52}{25}$ **D.** $\frac{5}{52}$

v. According to commutative property, $-\frac{7}{9} \times \frac{2}{5}$ is equal to _____.

A. $\frac{7}{9} \times \frac{2}{5}$ **B.** $\frac{2}{5} \times \frac{(-7)}{9}$

C. $\frac{9}{7} \times \frac{5}{2}$ **D.** 1

2. Find the sum or difference.

a. $\frac{1}{-3} + \frac{1}{6}$

b. $-\frac{2}{7} - \frac{5}{14}$

c. $-\frac{5}{8} - \frac{1}{5}$

3. Find the product or quotient for the following.

a. $-\frac{1}{5}(-20)(-5)$

b. $-\frac{3}{5} \div 12$

c. $5 \div \left(-\frac{10}{11}\right)$

4. Find the additive and multiplicative inverse of the following rational number.

a. -12

b. $\frac{1}{4}$

c. $-\frac{3}{4}$

d. $-\frac{13}{29}$

5. Simplify the following:

a. $8\frac{2}{5}+\left(-6\frac{3}{4}\right)+\left(3\frac{1}{6}\right)$

b. $5\frac{2}{3}-\left(-2\frac{5}{3}\right)+\left(7\frac{1}{4}\right)$

c. $2\frac{2}{3}+\left(-3\frac{2}{3}\right)+\left(-1\frac{1}{2}\right)$

d. $7\frac{2}{3}+\left(-5\frac{1}{6}\right)+\left(-3\frac{1}{12}\right)$

e. $9\frac{2}{3} + \left(5\frac{1}{2}\right) + \left(3\frac{5}{6}\right)$

f. $-\frac{5}{7} \times \left(-\frac{28}{15} + 1\frac{2}{3}\right)$

g. $\left[-\frac{1}{4} - \left(-\frac{1}{3}\right)\right] + \left(\frac{1}{4} - \frac{1}{3}\right)$

h. $10 - \frac{15}{8} \times \left(\frac{3}{2} \div 4\frac{1}{2}\right) + \left(-\frac{1}{4}\right)$

6. Use distributive law to solve the following.

a. $\frac{1}{2} \times \frac{1}{3} + \frac{1}{2} \times \frac{1}{4}$

b. $-5 \times \left(-\frac{1}{6}\right) - 7 \times \left(-\frac{1}{6}\right)$

7. Sami bought $4\frac{1}{2}$ liters of juice to serve at his birthday party. If a glass is $\frac{1}{16}$ of a liter, how many glasses can be served?

8. Maria has 8 cups of chips to divide into $\frac{2}{3}$ cup portions. How many portions will there be?

Unit 3

Squares and Square Roots

Review Worksheet

1. Encircle the correct answer for the following questions.

i. The number _____ is neither prime nor composite.

A. 0 **B.** 1

C. 2 **D.** 10

ii. The square of an odd positive integer is _____.

A. odd **B.** even

C. odd or even **D.** negative number

iii. The square of an even positive integer is _____.

A. odd **B.** even

C. odd or even **D.** negative number

iv. $\sqrt{\frac{196}{225}}$ is equal to _____.

A. $\frac{12}{13}$ **B.** $\frac{14}{15}$

C. $\frac{13}{14}$ **D.** $\frac{15}{14}$

v. $\left(\frac{8}{9}\right)^2$ is equal to _____.

A. $\frac{64}{81}$ **B.** $\frac{81}{64}$

C. $\frac{2}{3}$ **D.** $\frac{100}{16}$

2. Find the two twin prime numbers whose sum is 144 and they lie between 70 and 80.

3. Express each of the following as sum of three prime numbers:

a. 38

b. 31

c. 41

4. Evalute. $\sqrt{\frac{2809}{4096}}$

5. Calculate. $\sqrt{5\frac{41}{64}}$

6. Find the square root of the following using prime factorisation.

a. 12100

b. 4356

7. Find square root of

a. 1.69

b. 0.0144

c. 12.25

d. 0.1936

8. 8100 students are asked to stand in different rows. Every row has as many students as there are rows. Find the number of rows.

9. Find the perimeter of a square whose area is 3025 m^2.

10. Find the positive number, which when multiplied by itself gives 110.25.

Unit 4

Rate, Ratio, and Proportion

Review Worksheet

1. Choose the correct option.

i. The price of a ring is Rs 250 and necklace is Rs 500. The ratio of the price of ring to that of necklace is _____.

A. 500 : 250 **B.** 50 : 25

C. 1 : 2 **D.** 2 : 1

ii. Tahir buys 12 cans of juice for Rs. 600. At this rate, she pay _____ for 48 cans of juice?

A. Rs. 2000 **B.** Rs. 2200

C. Rs. 2400 **D.** Rs. 3000

iii. If 8 workers can paint a building in 24 days, then 18 workers will take _____ days.

A. 54 **B.** 45 km/h

C. 60 km/h **D.** 90 km/h

iv. The ratio of male and female patients seen by a doctor in a day is about 2 to 5. If a doctor saw 40 patients in one day, there were _____ female patients.

A. 5 **B.** 12

C. 29 **D.** 40

v. At a zoo, there is 1 adult for every 12 children. If there are 156 children visiting the zoo, _____ can be used to find x, the number of adults.

A. $\frac{x}{12} = \frac{1}{156}$ **B.** $\frac{12}{1} = \frac{x}{156}$

C. $\frac{1}{12} = \frac{x}{156}$ **D.** $\frac{x}{1} = \frac{12}{156}$

2. Increase 550 g in the ratio 5 : 8

3. Decrease I228 l in ratio 3 : 4

4. When Rs. I43 is divided in the ratio 2 : 4 : 5. What is the difference between the largest share and the smallest share?

5. If a car travels 36 km on I.5 liter of petrol, how far can the car travel on 2.4 liters of petrol?

6. 8 workers are hired to build a house in 15 days. How many days are required if 2 additional workers are hired?

7. A school's computer club has 350 boys and 175 girls. If the number of girls is decreased in the ratio 4:5 while the number of boys is increased in the ratio 6:5, what is the new ratio of boys to girls?

8. A coach leave a station at 22:55 and arrive at its destination at 04:05 the next day. Find

a. the time taken for the journey,

b. the time if the coach reached 35 minutes before schedule.

9. Sarmad traveled 400 km from A to B. He left A at 10:45 and arrived at B at 16:05.

a. How long did the journey take? Give your answer in hours and minutes.

b. Find the average speed, in kilometers per hour, for Sarmad's journey.

Unit 5

Financial Arithmetic

Review Worksheet

I. Choose the correct option in the following.

i. If the difference between selling price and cost price of an item is greater than the cost price, it is called _____.

A. cost price **B.** selling price

C. loss **D.** profit

ii. Ushr is paid at the time of _____.

A. Eid–ul–Fitr **B.** Harvest

C. Cultivation **D.** First Ramadan

iii. Property tax is based on the _____ oblained from the property.

A. financial year **B.** lunar year

C. solar year **D.** tax year

iv. Value added tax is imposed on _____.

A. Goods **B.** Services

C. Salary **D.** Both a & b

v. Gross income is the total income earned by a person during one _____.

A. day **B.** week

C. month **D.** year

2. Calculate general sales tax at 16% on a gas bill when:
Gas charges = 1180, Meter rent = 20
Hint: GST is applied on the sum of gas charges and meter rent.

3. Kamal paid property tax Rs. 50,000 on the property worth Rs. I00,0000. What is the rate of property tax?

4. Rabia saved Rs 800,000 in a year. Calculate how much zakat is due on her?

5. The cost of a shirt was Rs I500. If I5% value-added tax was charged, find the payable amount.

6. Qasim, a property agent got a commission of Rs. 15000 both from the buyer and the seller. Find percentage of commission if he sold a plot for Rs. 750000.

7. Marium makes a commission of 25% on selling handbags. If the price of a bag is Rs 360 and she sells 10 such bags, how much commission does he make?

Unit 6

Algebraic Expressions

Review Worksheet

1. Encircle the correct option in the following statements.

i. The next term of the sequence $\frac{1}{27}, \frac{1}{9}, \frac{1}{3}, \ldots$ is _____.

A. 1 **B.** $\frac{1}{2}$

C. $\frac{1}{3}$ **D.** $\frac{1}{9}$

ii. The degree of the polynomial $3x^3 + 2x^2 + 1$

A. 2 **B.** 3

C. 1 **D.** 4

iii. The square of $x + 2y$ is:

A. $x^2 + 4y^2$ **B.** $x^2 + 4y^2 + 4xy$

C. $x^2 + 4y^2 - 4xy$ **D.** $x^2 - 4y^2$

iv. The product of $(\sqrt{x} + \sqrt{y})$ and $(\sqrt{x} - \sqrt{y})$ is:

A. $x + y$ **B.** $x^2 - y^2$

C. $x^2 + y^2$ **D.** $x - y$

v. The addition of $2x + 3$ and x 2 is_____.

A. $2x^2 + 5$ **B.** $2x^2 - 3x$

C. $3x + 5$ **D.** $3x^2 + 5$

2. Expand and simplify (if possible) the following.

a. $(x + 5)(x + 7)$

b. $(3x + 7)(3x - 2)$

c. $(x + 2)(4x^3 + 6x^2 - 3x + 7)$

d. $(5x^2 + 6x + 8)(3x + 2)$

e. $(2a + 5)^2$

f. $(x - 2y)^2$

g. $(a + b)^2 + (2a + 2b)^2$

h. $(3x + 4y)^2 + 2x$

i. $(a + 4)(a - 4) + a^2$

3. Factorise the following.

a. $p^2 + p$

b. $m^3 + m$

c. $2x^3 + 4x$

d. $4x^2 - 20x^2$

e. $2a^3 + 7a^2 + a$

f. $x^2 + 20xy + xy + yz$

g. $t^2 + 4t - st - 4s$

h. $x^3 - x^2y^2 - x^3y$

i. $x^2(x - y) - y^2(x - y) + z^2(x - y)$

4. Factorise the following by breaking the middle term.

a. $x^2 + 19x + 18$

b. $6x^2 + 19x + 10$

c. $3x^2 + 22x - 16$

d. $3x^2 - 19x + 16$

e. $a^2 - a - 12$

f. $x^2 - 5x - 6$

g. $3y^2 + 5y + 2$

h. $t^2 - 21t + 90$

5. Find the perimeter of square of side $x + y$.

6. Find the area of a square of side $4a - b$.

7. Select a Number of your choice and create a sequence by multiplying each term by $\frac{1}{2}$.

8. Given the general term of a sequence $2n + 1$, find its 25th term.

Unit 7

Linear Equations

Review Worksheet

1. Tick the correct option.

i. The point $(-x, y)$ lies on _____ if x and y are positive.

A. first quadrant **B.** second quadrant

C. third quadrant **D.** forth quadrant

ii. A linear equation represents a _____.

A. circle **B.** curve

C. straight line **D.** square

iii. An algebraic sentence that includes $<$, $>$, $\leq$, or $\geq$ is called _____.

A. inequality **B.** expressions

C. equation **D.** operation

iv. Solution of a linear equation means to find the value of the _____.

A. constant **B.** coefficient

C. known quantity **D.** unknown quantity

v. In the equation $3x - 1 = 17$, the value of x is _____.

A. 2 **B.** 4

C. 5 **D.** 6

2. Solve the following equations.

a. $2x + 5 = 21$

b. $5x - 7 = 2x + 3$

c. $2y + 3 = 16 - (2y - 3)$

d. $\frac{y}{3} + 2 = \frac{1}{3}$

e. $y + \frac{4}{5} = 2y - \frac{1}{3}$

f. $\frac{x - 8}{3} = \frac{x - 3}{5}$

g. $\frac{x}{9x - 2} = \frac{1}{8}$

f. $\frac{x}{2} + 7 = 3(\frac{x}{5} + 2)$

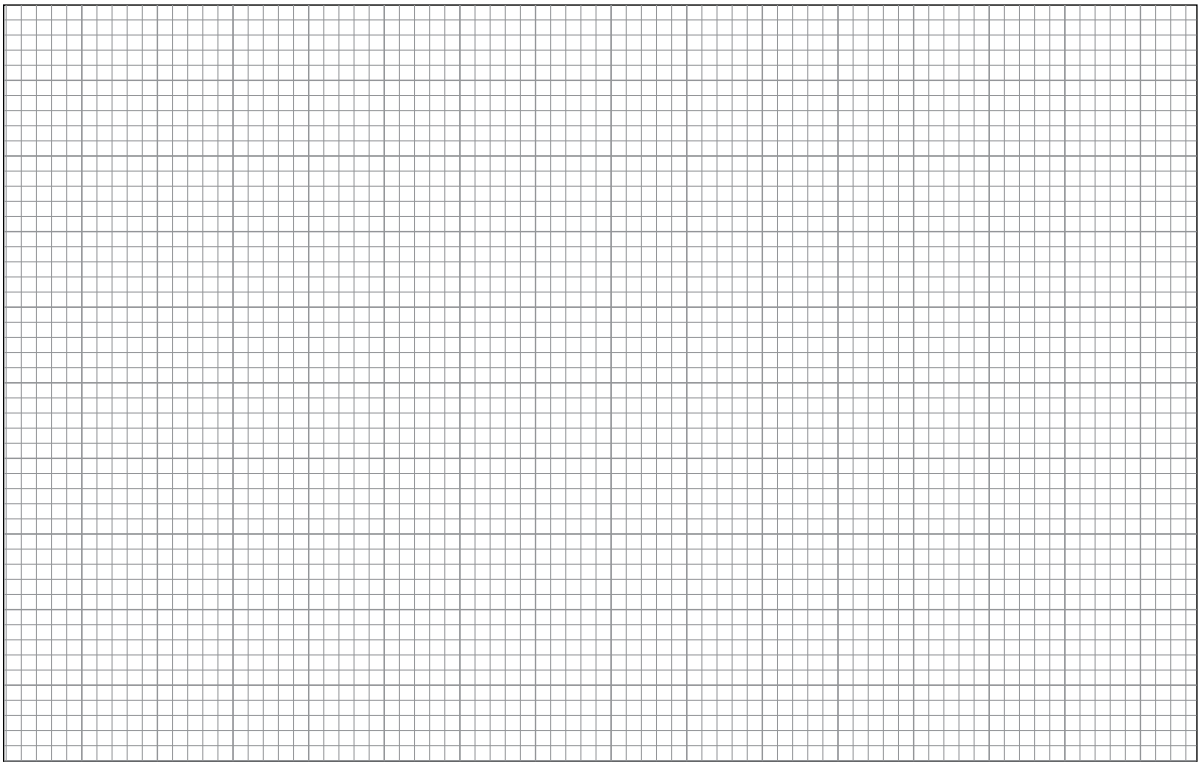
3. When 4 is subtracted from 5 times a number, the result becomes 41. Find the number.

4. When a number is added to two-thirds of itself, the result in 45. Find the number.

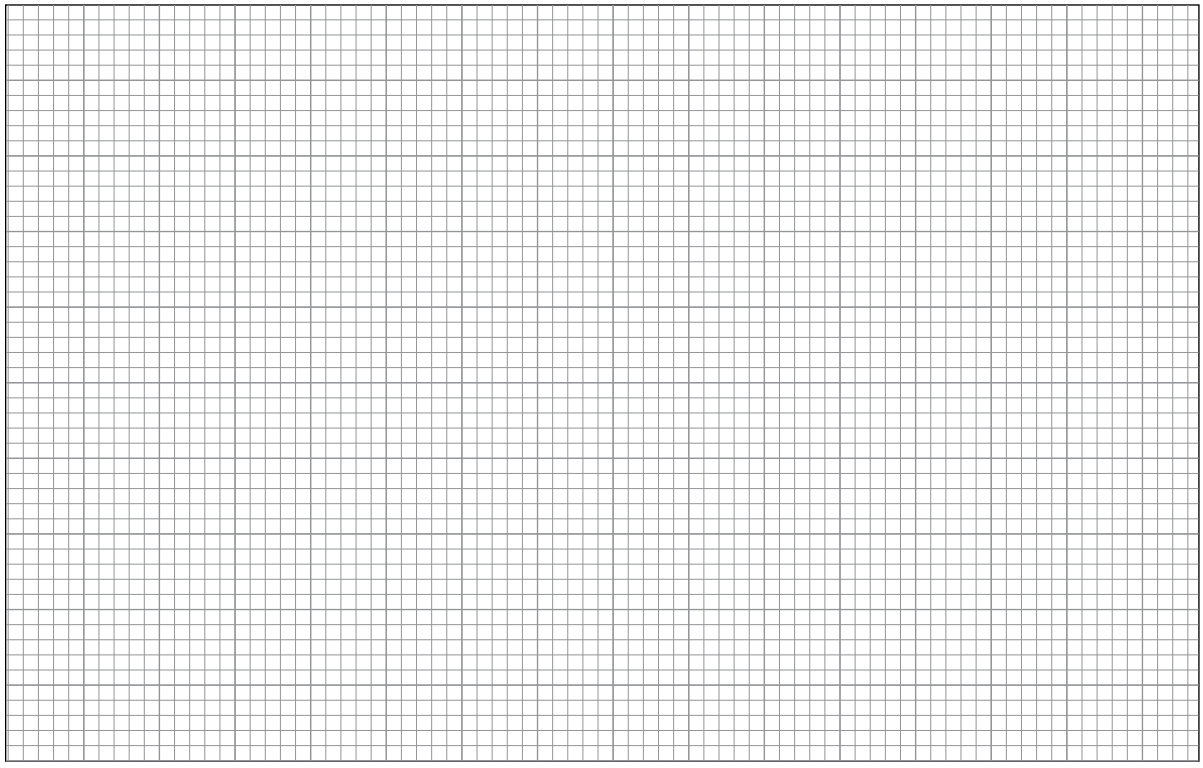
5. Length of a rectangle exceeds its breadth by 4m. If the perimeter of the rectangle is 84m, find the length and breadth of the rectangle.

6. Plot the graph of the following equations.

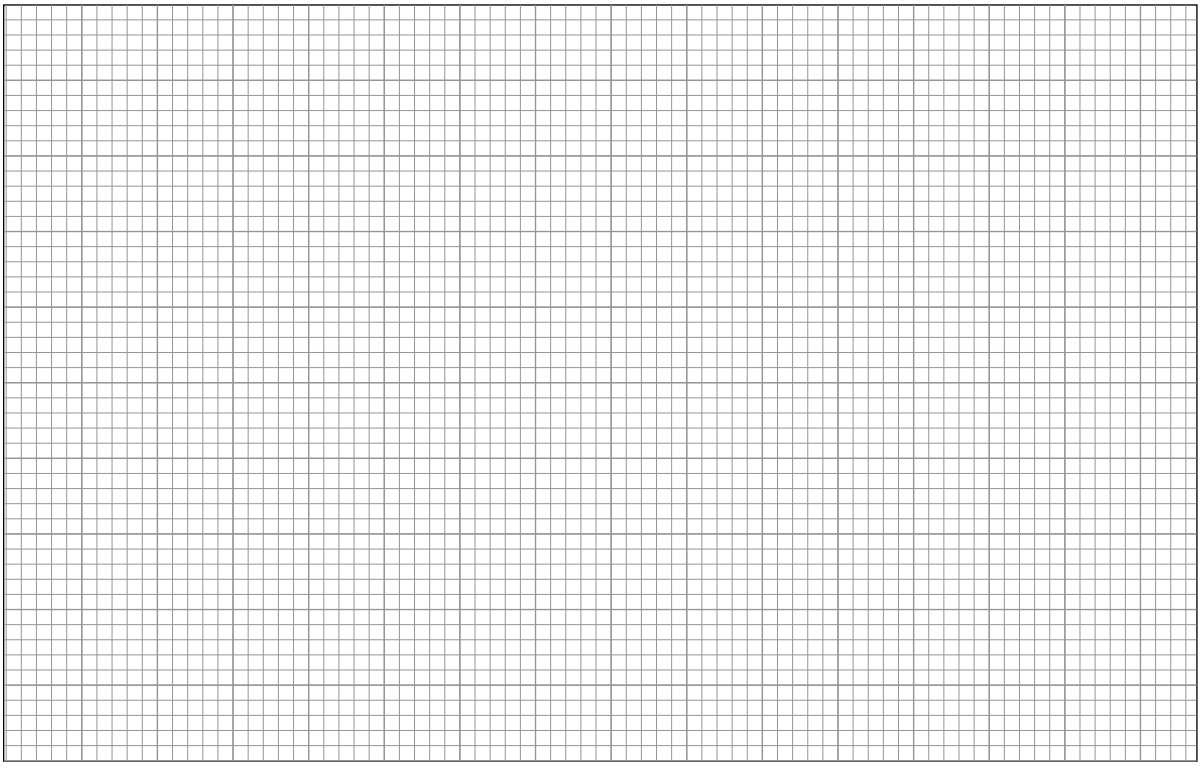
a. $3x + y = 2$



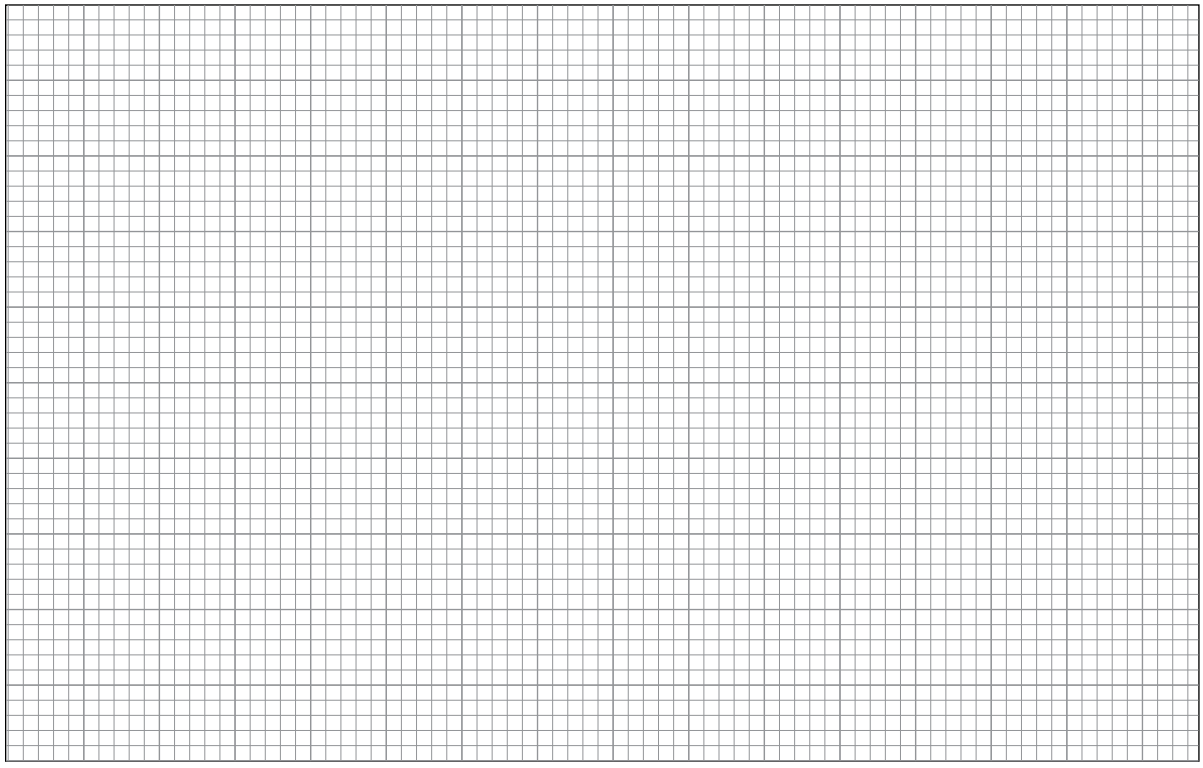
b. $-4x + y = 3$



c. $x = 2 - y$



d. $x = -4 - 2y$



Review Worksheet

I. Encircle the correct answer in the following.

i. Shape _____ is not an example of polygon.

A.  **B.** 

C.  **D.** 

ii. A polygon in which all the sides are equal is called _____.

A. regular **B.** irregular

C. rectangular **D.** proper

iii. Shape _____ is an example of concave polygon.

A.  **B.** 

C.  **D.** 

iv. The two diagonals of square are _____.

A. parallel **B.** equal

C. unequal **D.** converging

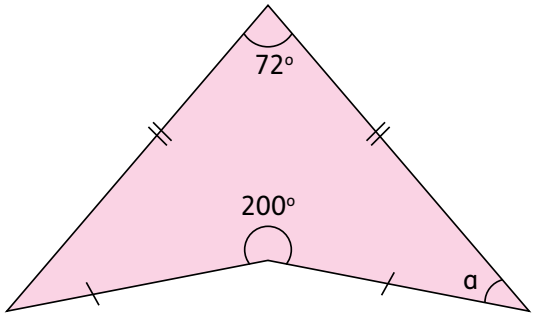
v. Interior angle of a regular hexagon is _____.

A. 180^0 **B.** 135^0

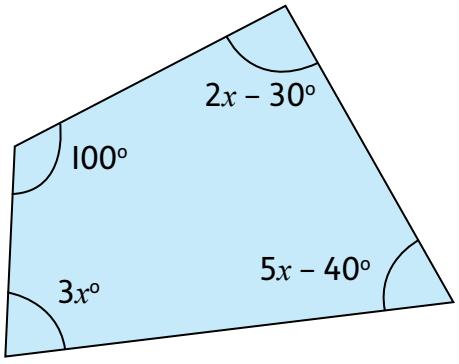
C. 120^0 **D.** 109^0

2. Find the value of unknowns in the following figures.

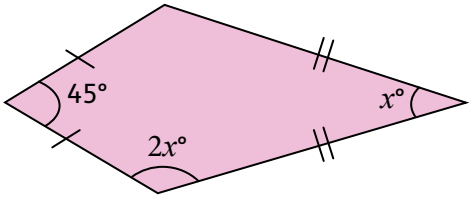
a.



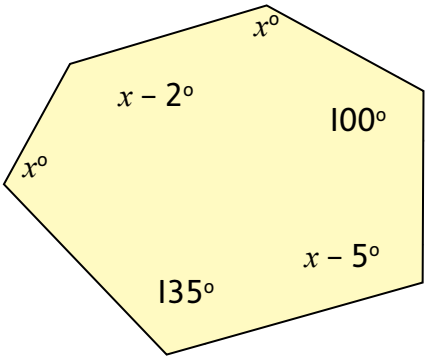
b.



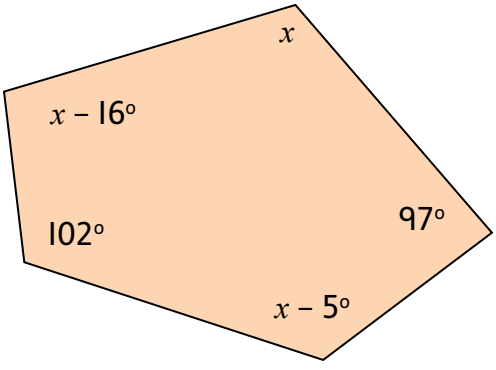
c.



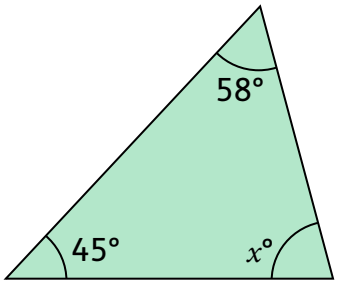
f.



g.

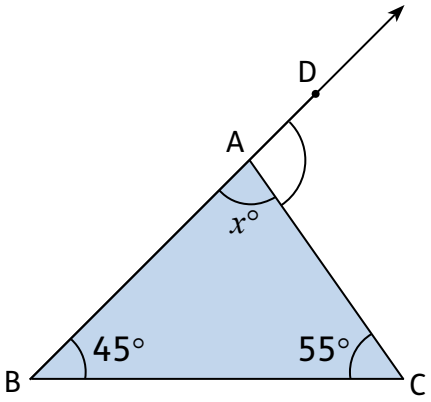


3. Find the value of x.

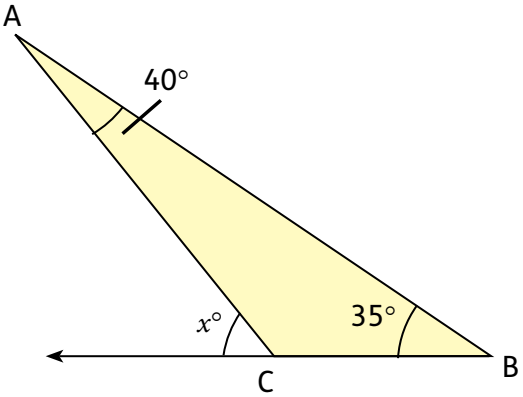


4. Find the value of x and y.

a.

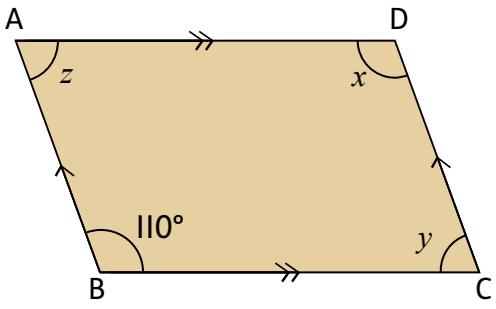


b.

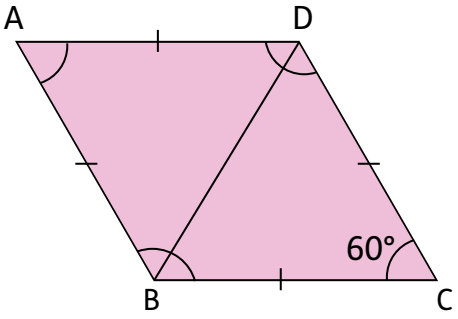


5. Find the remaining angles in the following parallelograms:

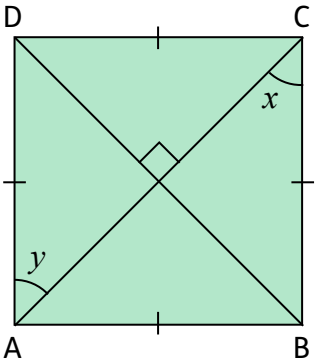
a.



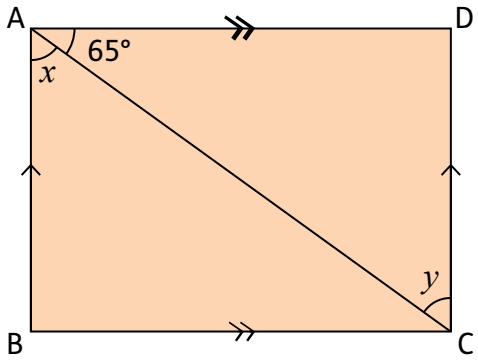
b.



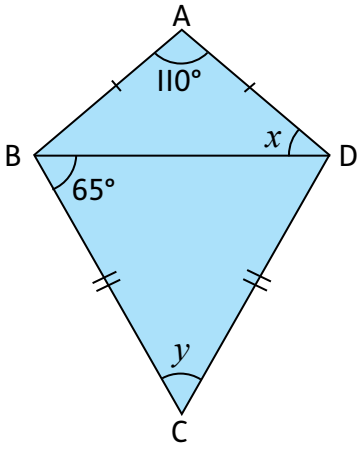
c.



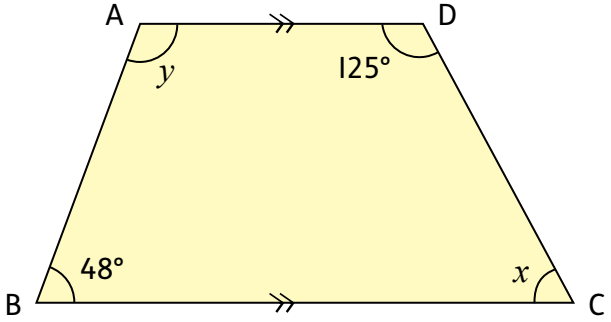
d.



e.



f.



Unit 9

Practical Geometry

Review Worksheet

1. Tick the correct answer in the following.

i. Only two sides of triangle are equal _____.

A. an equiangular **B.** a scalene

C. an equilateral **D.** an isosceles

ii. Sum of measures of three angles of a triangle is _____.

A. 45^{o} **B.** 160^{o}

C. 180^{o} **D.** 360^{o}

iii. _____ triangle correspends to m $\angle A = 60^{o}$, m $\angle B = 90^{o}$, and m $\angle C = 30^{o}$

A. right-angled **B.** acute-angled

C. obtuse-angled **D.** equailateral

iv. Interior angle of an equilateral triangle is _____.

A. 180^{0} **B.** 120^{0}

C. 90^{0} **D.** 60^{0}

2. Construct the following triangles.

a. Triangle ABC when length of sides are 4.3cm, 6cm and 3.8cm.

b. Triangle XYZ when XY = 5.6cm, YZ = 4cm, $\angle Y = 75^0$

c. Triangle PQR when RQ = 5.2cm, $\angle R = 30^0$, $\angle Q = 120^0$

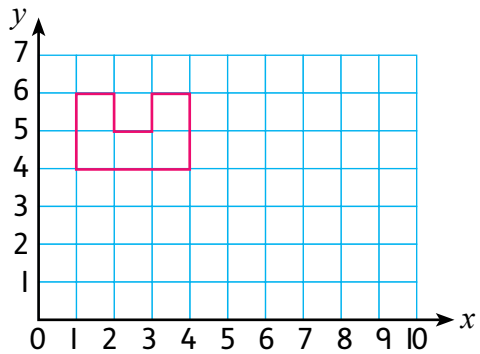
d. Triangle DEF when hypotenuse and one side are 5.7cm and 4.5cm long respectively.

3. Construct a triangle LMN of suitable measurement. Draw a perpendicular from N to $\overline{LM}$. Measure its length.

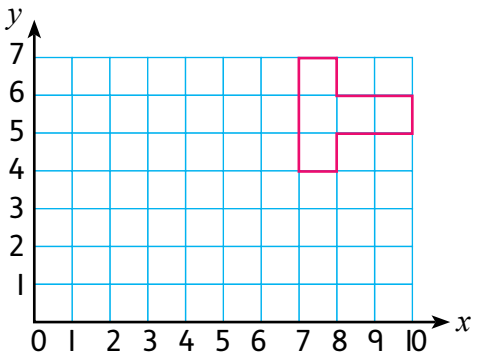
4. Draw $\overline{AB}$ = 5cm. Mark a point P outside the segment, and draw perpendicular from P to $\overline{AB}$.

5. Translate each shape using the given translation.

a. move over 4 units down and 3 units right



b. move over 4 units down and 6 units left



Unit 10

Measurement

Review Worksheet

1. Choose the correct option in the following.

i. The ratio between circumference and diameter of circle is _____.

A. π **B.** r

C. h **D.** A

ii. Circumference of a circle having a ratius 7 cm is _____.

A. 44 cm^2 **B.** 22 cm^2

C. 44 cm **D.** 22 cm

iii. A wheel has a circumference of 22 cm, then the diameter is _____.

A. 2I cm **B.** I4 cm

C. 3.5 cm **D.** 7 cm

iv. Surface area of a triangular prism in which, a = b = c, is _____.

A. $2al + 3ah$ **B.** $3al + 2ah$

C. $al + 2ah$ **D.** $3al + ah$

v. Area of a base of a prism is 50 cm^2. _____ is the volume of prism if its height is 4cm?

A. 300 cm^3 **B.** 200 cm^3

C. I00 cm^3 **D.** 50 cm^3

2. A circular table cover has a radius of 70 cm. Find the cost of doing pico the table cover at the rate of Rs.20 per metre.

3. A piece of wire of length 6.28 cm is bent to form a circle. Find the area enclosed by circle so formed. ($\pi \approx 3.14$)

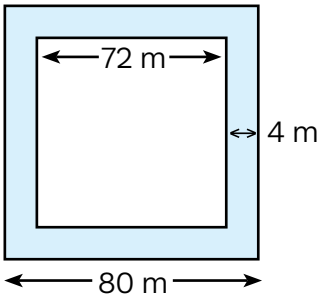
4. Radius of the base of a cylinder is 2.1 m. Find the height of the cylinder if its volume is 693 m^3.

5. A train left a city at 9.45 a.m. and arrived at its destination at 1.30 p.m. How long did the journey take?

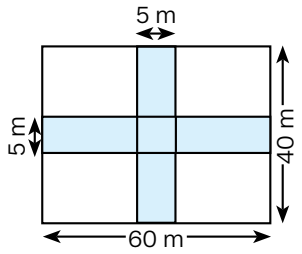
6. Find the average speed of Sarim, who covers the first 300 kilometres in 4 hours and the next 190 kilometres in another 3 hours. Convert your answer in m/sec.

a. A bus leaves for Sukkur at 4.30 p.m. It takes 4 hr 25 min to reach there. At what time will it reach Sukkur?

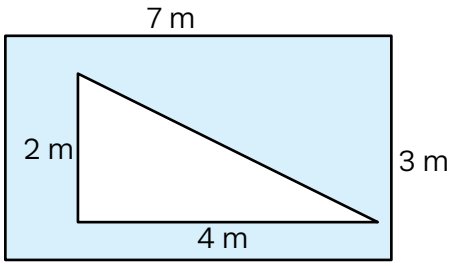
b. A path 4 m wide runs around the inside of a square park of side 80 m. Find the area of the path. Convert your answer in cm^2.



c. A rectangular park, 60 m long and 40 m wide, has two paths, each 5 m wide, running at right angles to each other through the middle of the park, one parallel to the length and the other parallel to the width. Calculate the cost of constructing the paths at Rs 500 per m^2.

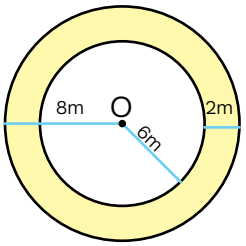


d. Find the area and perimeter of the shaded region in the following shapes.



e. Find the area of a circle of radius 7 cm.

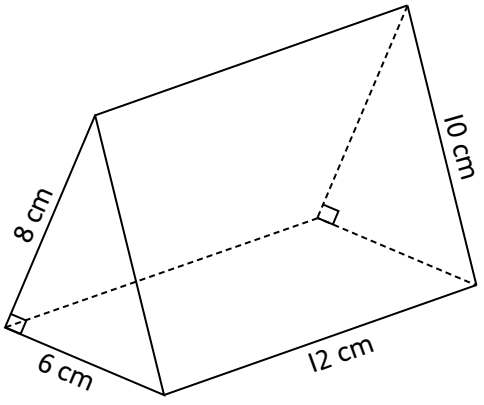
f. A circular park of radius 8 m has a path 2 m wide running around the inside of its boundary. Find the cost of paving the path at the rate of Rs 600 per square metre.



8. A rectangular block is formed by sticking two identical triangular prisms. One such prism is shown in the figure:

a. What is the furface area of this triangular prism?

b. What is the volume of this triangular prism?



Unit 11

Data Handling

Review Worksheet

1. Circle the correct answer in the following questions.

i. The most repeated value in the data is called _____.

A. mean **B.** mode

C. median **D.** range

ii. Probability of 0 means that the event is _____to happen.

A. Impossible **B.** unlikely

C. likely **D.** certain

iii. Probability of I means that the event is _____ to happen.

A. Impossible **B.** unlikely

C. likely **D.** certain

iv. The set of all possible outcomes of an experiment is _____.

A. Event **B.** Sample space

C. Favorable outcome **D.** Combined outcome

v. The probability of getting a prime number is _____, when a dice is rolled once.

A. $\frac{1}{6}$ **B.** $\frac{1}{3}$

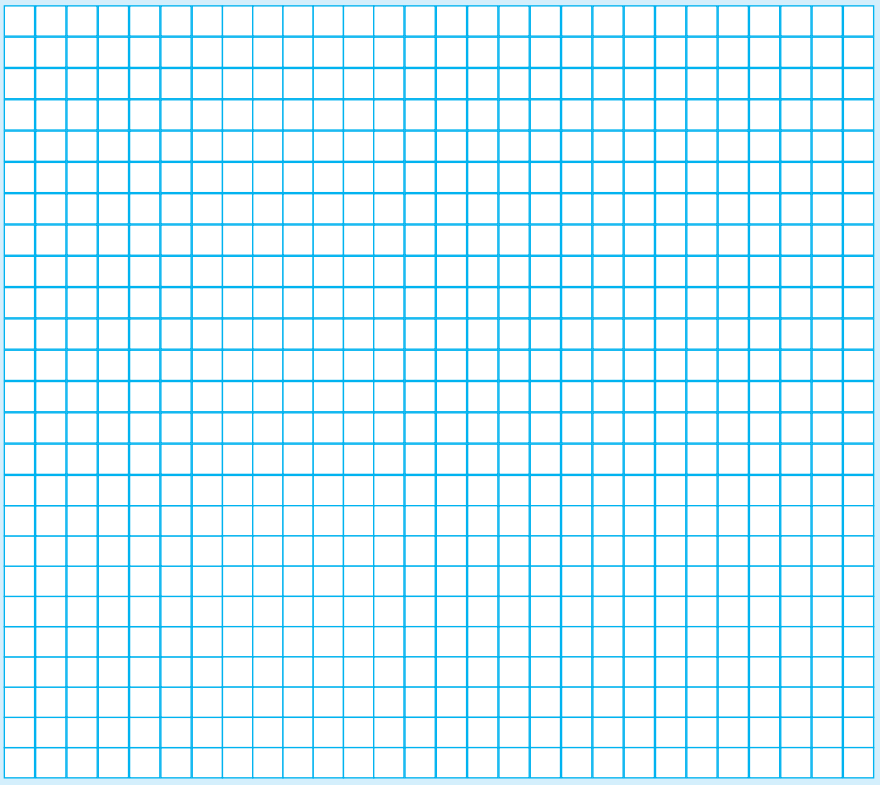
C. $\frac{1}{2}$ **D.** $\frac{2}{3}$

2. At the annual track event, the time taken, in minutes, by 50 athletes to run a 1-km course is presented in the form of the data below. Create a frequency distribution table consisting of 6 classes.

13, 14, 20, 15, 16, 18, 20, 25, 27, 17, 13, 15, 20, 14, 18, 19, 14, 26, 20, 15, 18, 17, 16, 19, 20, 30, 24, 15, 14, 16, 19, 15, 16, 19, 12, 15, 18, 16, 19, 14, 15, 18, 17, 16, 20, 17, 14, 13, 18, 20

3. The Quaid-e-Azam Football Club of Karachi played 25 games in a particular season. The outcomes of the games are tabulated below. Draw a bar graph to represent the data.

Result	Win	Lose	Draw	Abandon
No. of Games	10	8	5	2



4. Out of Rs 45 000 earned by Kulsoom, she spends Rs 15 000 on food, Rs 8000 on utilities, Rs 7000 on entertainment, and Rs 15 000 on rent. Construct a pie chart for the data.

5. Find the mean, median, and mode for the given data:

20, 50, 30, 34, 45, 27, 40, 10, 50, 50, 48, 52

6. The following table shows data values along with their respective weights. What is the weighted mean?

x	12	10	14	8	11	12	13
w	2	3	4	5	6	7	8

7. On Wednesday Ahmer has a choice of having custard, ice-cream cake, or banana pudding in lunch. The probability of choosing custard is 0.5 and probability of choosing ice-cream cake is 0.3.

a. Find the probability of choosing not to have ice-cream cake.

b. Find the probability of choosing to have pudding.

8. A bag contains 36 identical discs. 5 are marked with the letter V. I2 are marked with the letter W. The rest are unmarked. A disk is chosen at random. Find the probability that the disk chosen is:

a. marked

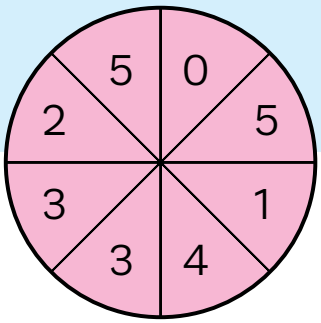
b. unmarked

9. There are 24 red balls and x white balls in a bag. A ball is drawn random from the bag. Given that the probability that the ball drawn is white is $\frac{3}{7}$.

a. Write down the probability that the ball drawn is red.

b. Calculate the value of x.

10. The spinner has 8 equal sectors.
Find the probability of:



a. spinning a 5

b. not spinning a 3

c. spinning a 6

d. not spinning a 6