

WORK SHEET
SECOND TERM
SUBJECT- MATHEMATICS
CLASS- VII

COMPARING QUANTITIES

1. The population of a town increases 8% annually. If its present population is 142560, what was it a year ago?
2. Find-(a)7.5% of 80 kg (b)8% of 5 litres (c)0.25% of 16
3. Calculate what % of-(a)40m is 16m (b)1 kg is 25 gram
4. Rohit bought a stereo for Rs 5863.Due to some defects in it, he had to pay Rs.137 to the mechanic for its repair. Then, he sold it for Rs 5700.Find his loss percent.
5. By selling a chair for Rs 720, a trader gains 20%. Find the cost price of the chair.
6. An electrician sells a room heater for Rs 322, getting $\frac{1}{6}^{\text{th}}$ of its C.P. Find his gain percent.
7. Find the simple interest on Rs 2500 for 2 years 6 months at 6% per annum. Also, find the amount.
8. What sum will amount to Rs 4590 at 12% per annum simple interest in 3 years?
9. At what rate % per annum will Rs 1650 amount to Rs 2046 in 3 years?
10. What is 100% of 80?
11. The simplest form of $3\frac{1}{2}:10\frac{1}{2} =$ _____.
12. What is 7:10 equal to in percent?
13. In each case of profit, which is more S.P or C.P?
14. Gain or loss percent is calculated on C.P or S.P?
15. What is 1% of 100?
16. What is 0.35 equivalent to in percent?
17. What is the equivalent fraction for 20%?
18. What is the number whose 8% is 20?
19. Find the interest on Rs.5250 at 8% p.a for a period of 3 yrs. & 4 months.

RATIONAL NO.

1. Arrange the following rational no. in descending order-

(a) $-\frac{2}{5}, \frac{7}{10}, \frac{11}{15}, \frac{19}{-30}$

(b) $\frac{3}{4}, \frac{5}{12}, \frac{7}{16}, \frac{9}{24}$

2. Compare the given rational no. using <,>,<= signs-

(a) $\frac{5}{9} \square -\frac{3}{-8}$

(b) $\frac{9}{-13} \square \frac{7}{-12}$

(c) $\frac{2}{3} \square \frac{4}{5}$

3. Enlist any 5 rational no. between-

(a) $\frac{2}{5}$ and $\frac{4}{9}$

(b) $-\frac{3}{7}$ and $-\frac{5}{8}$

4. Represent each using a no.line-(a)- $\frac{1}{3}$ (b)- $\frac{7}{5}$ (c) $\frac{13}{6}$

5. Evaluate each-(a) $\frac{11}{12} + \frac{5}{9}$

(b) $-\frac{8}{9} + (-\frac{3}{5})$

(c) $\frac{3}{7} + (-\frac{2}{14})$

(d) $(-\frac{7}{6}) - (-\frac{3}{5})$

(e) $\frac{7}{11} - \frac{2}{3}$

(f) $\frac{4}{7} \times \frac{21}{16}$

(g) $\frac{6}{8} \times \frac{9}{36}$

(h) $\frac{14}{20} \div \frac{6}{3}$

(i) $\frac{9}{12} \div \frac{3}{4}$

6. Add $\frac{2}{3}$ & $\frac{5}{6}$

7. Subtract $\frac{8}{11}$ from $\frac{100}{121}$.

8. Find additive inverse of($\frac{0}{5}$).
9. Find the product of the multiplicative inverse of both (-8) & ($\frac{-1}{16}$).
10. Evaluate $0 \div \frac{1}{5}$.
11. Fill in the blanks :-
 - a. The sum of two rational numbers is always a _____.
 - b. The sum of 0 & any rational number is the _____ itself.
 - c. The difference of two rational numbers is always a _____.
 - d. The product of any rational number with 1 is the _____ itself.
12. True or false :-
 - a. The reciprocal of -1 is 1.
 - b. The product of two rational numbers is a rational number.
13. Subtract the sum of $\frac{-3}{7}$ & $\frac{5}{14}$ from the sum of $\frac{11}{16}$ & $\frac{-2}{3}$.
14. The sum of two rational numbers is $\frac{15}{16}$. If one of them is $\frac{-5}{8}$, find the other.
15. By what rational number should $\frac{-12}{52}$ be multiplied to obtain 39?

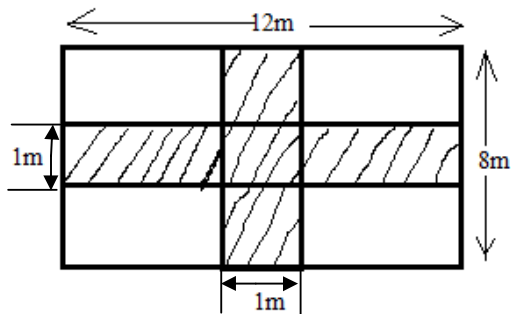
PRACTICAL GEOMETRY

1. Construct a triangle ABC in which AB=7 cm, angle A=45 and angle C=75.
2. Construct a triangle ABC in which BC=4.8 cm, angle C=90 and AB=6.3 cm.
3. Construct a right-angled triangle one side of which measures 3.5 cm and the hypotenuse is 6 cm.
4. Construct a triangle XYZ in which YZ=5.8 cm, angle Y=angle Z=30. Measure XY and XZ. What do you observe?
5. Construct a triangle PQR in which QR=6 cm, PQ=4.4 cm and PR=5.3 cm. Draw the bisector of angle P.
6. Construct an equilateral triangle each of whose sides measures 6.2 cm. Measure each one of its angles.

AREA AND PERIMETER

1. Find the area of a rectangular plot, one side of which measures 35 m and the diagonal is 37 m.
2. A room is 9 m long, 8 m broad and 6.5 m high. It has one door of dimensions 2m x 1.5 m and three windows each of dimensions 1.5 m x 1m. Find the cost of whitewashing the walls at Rs.3.80 per square metre.
3. A rectangular lawn measuring 50 m by 36 m is surrounded externally by a path which is 2 m. Find the area of the path. Also calculate the cost of levelling the path at Rs.2.50 per metre square.
4. A rectangular lawn is 60 m by 40 m and has two roads, each 5 m wide running in the middle of it, one parallel to its length and the other parallel to the breadth. Find the cost of gravelling the roads at Rs.5.90 per square metre.
5. The lengths of the sides of a triangle are 33cm, 44cm and 55cm. Find the altitude corresponding to the side measuring 44cm.
6. The cost of painting the top surface of a triangular board at 80 paisa per metre sq is Rs.176.40. If the height of the board measures 24.5 m, find its base.
7. The adjacent sides of a parallelogram are 15 cm and 8 cm. If the distance between the longer sides is 4 cm, find the distance between the shorter sides.
8. The diameter of the wheel of a car is 70 cm. How many revolutions will it make to travel 99 km?

9. A wire is in a circular shape of radius 28 cm. If it is bent in the form of a square, what will be the area of the square formed?
10. The area of a circle is 1386 m sq. Find its circumference.
11. Fill in the blanks:-
- 1) The area of a parallelogram is equal to _____.
 - 2) Perimeter of an equilateral triangle is _____.
 - 3) The _____ of a circle is equal to $2\pi r$.
 - 4) The magnitude of the plane region enclosed by a simple closed figure is called the _____ of that figure.
 - 5) 1 hectare = _____ m^2 .
12. The length & breadth of a rectangular plot are in the ratio 3:2. If the area of the field is $3456m^2$, find the cost of fencing the plot with wire if wire cost Rs. 2.75 per metre.
13. The base of the parallelogram is double of its height. If the area is $512m^2$, find the base & height.
14. The area of a rhombus is $119cm^2$ & its perimeter is 56cm. Find its altitude.
15. A carpet measures 25m by 20m. A border of width 50cm is printed along its side. Find the cost of printing the border at Rs. 20 per m^2 .
16. Find the area of the shaded region.



ALGEBRAIC EXPRESSIONS

- 1 Add the following-(a) $2x-3y, 5x+6y, -3x-4y$ (b) $5x-7y+3, -8x+2y-5, 7x-y-2$
2. Subtract-(a) $2x-5y+7$ from $3x+4y-6$ (b) $x-y$ from $4y-5x$ (c) $x-y+3z$ from $2z-x-3y$
3. Simplify the expressions and find the value when $x=2, y=-1$,
(a) $(5x-9y) - (-7x+y)$ (b) $(7-2x+5y) - (5x+3y-7)$
4. Find the value of each when $a=-1, b=-2, c=2$:-
(a) $a+ab-c$ (b) $2a-\frac{b}{2}+3c$ (c) $5abc-2b-3c+bc$
5. Find the factors of each expression-
(a) $6x-8y+15z$ (b) $100-15abc-25x$
6. Tick (\checkmark) the correct option:-
1) The expression $-5x^3yz^2$ is a
a) Monomial
b) Binomial

- 2) The coefficient of x in $4xy^2z$ is
- 4
 - $4y^2$
 - $4yz$
 - $4y^2z$
- 3) The sum of x^3-y^3 & y^3-x^3 is:-
- 0
 - $2x^3-2y^3$
 - $2y^3-2x^3$
 - x^6-y^6
- 4) The expression that should be added to (x^2-xy+y^2) to get (x^2+xy+y^2) is
- $x^2+2xy+y^2$
 - xy
 - $2xy$
 - $3xy$
- 5) The value of the expression x^3+y^3 when $x=1$, $y=-1$:-
- 1
 - 0
 - 2
 - 2

7. Fill in the blanks:-

- The algebraic expression $-3x^2y$ & y^3 are _____ terms.
- The factors of the term $-4x^2y$ are _____.
- If x^3 is subtracted from $2x^3-y^3$, we get _____.
- The perimeter of a quadrilateral whose sides measure a , $a+b$, $a+b+c$, $a+b+c+d$ units is _____.

SYMMETRY

1. How many lines of symmetry does each of the following have?

- (a)rhombus (b)parallelogram (c)equilateral triangle (d)scalene triangle
- (e)isosceles trapezium (f)square (g)rectangle

2. Complete the table –

Sl.	Shape	Centre of rotation	Order of Rotation	Angle of Rotation
1	Square			
2	Rectangle			
3	Rhombus			
4	Equilateral Triangle			
5	Regular Hexagon			
6	Circle			
7	Semi Circle			

3. Tick the correct option:

- A circle has:
 - No line of symmetry.
 - Infinite lines of symmetry.
 - Four lines of symmetry.
 - None of these.
- Which of the following has two lines of symmetry?
 - A square
 - A parallelogram
 - A kite
 - A rectangle
- The number of times a figure matches itself after rotation is called:
 - Axis of symmetry
 - Rotational symmetry
 - Order of symmetry
 - Reflectional symmetry

- 4) A rectangular pentagon has rotational symmetry of the order:
 a) 2 b) 4 c) 3 d) 5
- 5) The letter which has linear symmetry as well as rotational symmetry is
 a) X b) Q c) P d) S

4. Fill in the blanks:

- 1) A line which divides a given figure into two equal halves is called _____.
- 2) A _____ has four lines of symmetry.
- 3) A rhombus has _____ lines of symmetry.
- 4) A _____ has rotational symmetry of the order of four.
- 5) An isosceles triangle has no _____ symmetry.

5. True or False.

- 1) A hexagon has 4 lines of symmetry.
- 2) An equilateral triangle has exactly 3 lines of symmetry.
- 3) All the figures have rotational & linear symmetry.

6. Answer the following:

- 1) Explain the term “line of symmetry”.
- 2) What is the centre of rotation?
- 3) Which figure has only rotational symmetry but no line of symmetry?
- 4) Name a figure that has vertical & horizontal lines of symmetry but no rotational symmetry.

EXPONENTS AND POWERS

1. Express each using exponential notation –

- a) $A \times A \times A \times B \times B \times Z \times Z \times Z$
- b) 27000
- c) 12500
- d) 288

2. Compare the following:

- a) 3^4 and 4^3
- b) 3^5 and 5^3
- c) 2^6 and 6^2

3. Simplify each –

- a) $\frac{2^3 \times 3^4 \times 4}{3^2 \times 32}$
- b) $(3^0 + 2^0) \times 5^0$
- c) $\frac{2^8 \times a^5}{4^3 \times a^3}$
- d) $\frac{3^5 \times 10^5 \times 25}{5^7 \times 6^5}$

4. Write each in scientific notation –

- a) 0.00000000017 b) 384000000
- c) 1908.781 d) 0.000006532

5. The value of $(5^{30} \times 5^{10}) (5^7)^5$ in exponential form is _____

6. Tick (✓) the correct option:-

- I. In power notation $(\frac{-1}{5}) \times \frac{-1}{5} \times \frac{-1}{5} \times \frac{-1}{5}$ can be written as
 - a) $(-5)^4$
 - b) $(\frac{-1}{5})^4$
 - c) $(\frac{-1}{3})^3$

d) $-(\frac{1}{5})^4$

II. $(\frac{-7}{15})^1 = \underline{\hspace{2cm}}$.

a) $(\frac{-15}{7})$

b) $(\frac{-7}{-15})$

c) $\frac{7}{15}$

d) $\frac{-7}{15}$

III. $(-1)^{53} = \underline{\hspace{2cm}}$.

a) 1

b) -53

c) -1

d) 0

IV. The exponential form of $\frac{-343}{1331}$ is:

a) $(\frac{7}{11})^2$

b) $(\frac{7}{11})^3$

c) $(\frac{-7}{11})^3$

d) $-(\frac{7}{121})^2$

V. 40,000,000,000 in standard form is

a) 4×10^6

b) 4×10^{10}

c) 4×10^8

d) None of these

7. Fill in the blanks:

a) $(2^3)^5 = \underline{\hspace{2cm}}$.

b) $2^2 \div 3^2 = \underline{\hspace{2cm}}$.

c) Cube of $(-\frac{1}{7})$ is $\underline{\hspace{2cm}}$.

d) $(\frac{7}{11})^5 \div (\frac{7}{11})^3 = (\frac{7}{11})^{\underline{\hspace{1cm}}}$

e) $[(10)^{10}]^{10} = \underline{\hspace{2cm}}$.

8. True or False.

a) The value of a^1 is 1.

b) The exponential form of $\frac{32}{243}$ is $(\frac{2}{3})^5$.

c) $(x^m)^n = x^{mn}$.

d) The reciprocal of 6 is 6^{-1} .

e) $(-\frac{5}{3})^3$ is equal to $(-\frac{5}{3}) \times (-\frac{5}{3}) \times (-\frac{5}{3})$.

9. Solve the following:-

a) Simplify:- $(0.3)^2 \times 7^3 \times (-2)^2$

b) Find the value of $(-1)^{100} \times (-1)^{61} \times (1)^9$

c) Express 6752.25 in scientific notation.

d) Evaluate $(\frac{2}{5})^3$ & $(\frac{2}{3})^3$. Which is smaller of the two?

e) Write 0.0000537 in exponential form.

VISUALISING SOLID SHAPES

1. Write the no. of edges, faces and vertices for each –

a) cube

b) cuboid

c) cylinder

d) cone

e) triangular prism

f) triangular

g) square pyramid

h) hexagonal pyramid

2. The dimensions of a cuboid are 6cm, 4cm and 2cm respectively. Draw 3 different isometric sketches of the cuboid.

3. Four cubes of 2cm edge are placed side by side to form a cuboid. Sketch an oblique as well as an isometric sketch of the resulting cuboid.

4. Find the number of edges in a polyhedron having 8 faces and 12 vertices.

5. What cross-section is made in the following solids by: i) Vertical cut ii) Horizontal cut

- | | | |
|------------|------------------------|-----------------|
| a) a lemon | b) a brick | c) a tree trunk |
| d) a die | e) an egyptian Pyramid | |

6. Tick the correct option:

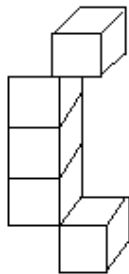
I) An isometric sheet is made up of dots forming:


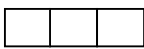
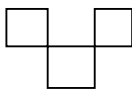

- a) Right angled triangles
- b) Equilateral triangles
- c) Squares
- d) Rectangles

II) The number of edges in a polyhedron having 8 faces & 12 vertices is:

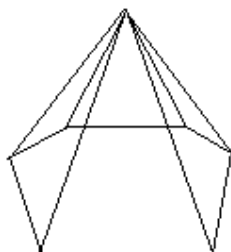
- a) 14
- b) 16
- c) 18
- d) 20

III) The top view of the solid shown in the figure below is:



- a)  b)  c)  d) 

IV) A horizontal cross-section of the solid shown in the adjoining fig. is a:



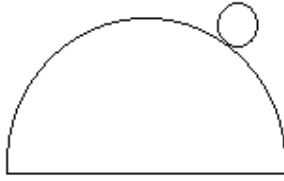
- a) Triangle b) Square c) Hexagon d) Octagon

V) The solid having only one vertex is a:

- a) Prism b) Pyramid c) Cylinder d) Cone

Q2. True or False.

- a) The shadow of a 3-D object is 2-D.
b) The net of a solid is unique.
c) A cylinder has 2 faces.
d) The front, side & top view of a sphere are different.
e) The given net is of a closed cone.



Q3. Fill in the blanks:

- a) The base of a pyramid is a _____ & its faces are _____ having a common vertex.
b) The two faces of a solid meet to form an _____.
c) A point where three or more faces meet is called a _____.
d) A solid that has congruent & parallel polygons as top & base joined by rectangular faces is known as _____.
e) A pyramid having 4 equilateral triangles as its faces is called a _____.

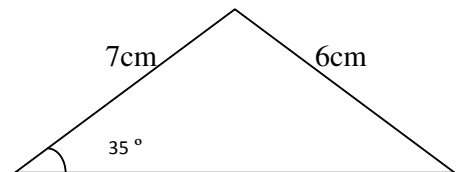
CONSTRUCTION

Q1. Mark the correct alternative in each of the following:-

- I) The number of parallel lines that can be drawn from a point outside the line to it is:
a. 0 b) 1 c) 2 d) infinite
- II) A triangle which is impossible to construct has sides measuring:-
a. 3cm,4cm,5cm b) 7cm,8cm,9cm c) 4cm,6cm,10cm d) 10cm,18cm,12cm
- III) A unique triangle cannot be constructed with which of the following sets of measurements?
a. 3 sides b) 3 angles c) 2 angles & an included side d) the hypotenuse & a leg

Q2. True or False.

- a) An acute angle & the length of hypotenuse is sufficient to construct a right triangle.
b) In a triangle the angle opposite the largest side is the smallest.
c) A $\triangle ABC$ whose dimensions are shown in the given figure can be uniquely constructed, i.e. SSA construction criterion is valid.



Q3. Fill in the blanks:-

- a) The _____ angle of a triangle is equal to the sum of the interior opposite angles.
b) In a right triangle, the square of the _____ is equal to the _____ of the squares of the other two sides.

Q4. Draw any line l. Draw another line m parallel to l at a distance of 6.6cm from it.

Q5. Construct a $\triangle ABC$ in which:-

- a) $BC = 5.5\text{cm}$, $AB = 5.7\text{cm}$, $AC = 6\text{cm}$
b) $AB = 6\text{cm}$, $AC = 6.5\text{cm}$ & $\angle BAC = 60^\circ$.
c) $BC = 6.5\text{cm}$, $\angle C = 45^\circ$ & $\angle B = 60^\circ$.

Q6. Construct a right angled triangle having hypotenuse 7cm & one of its acute angles measuring 45° .