APPENDIX - III

WORKSHEET 1

Q1 Write the numerator and denominator of each of the following rational numbers.
   (i) $\frac{12}{23}$
   (ii) $\frac{99}{-100}$
   (iii) $\frac{1}{101}$
   (iv) $\frac{-67}{167}$
   (v) $-16$

Q2 Which of the following are the rational numbers?
   -16, 7/-3, -14/-9, 1, 0/0, 0/100, 9/0, -72/8

Q3 Write the following rational numbers in the lowest form.
   (i) $\frac{-64}{428}$
   (ii) $\frac{-27}{729}$
   (iii) $\frac{99}{121}$
   (iv) $\frac{90}{-120}$

Q4 Write the rational number whose numerator and denominator are given below.
   (i) $\frac{79-36}{36+79}$
   (ii) $\frac{6\times3}{27+9}$

Q5 Express $\frac{-13}{12}$ as a rational number with numerator
   (i) $-169$
   (ii) 52

Q6 Express $\frac{19}{5}$ as a rational number with denominator
   (i) -80
   (ii) 400

Q7 Which of the following are the pair of equivalent rational numbers.
   (i) $\frac{-13}{7}$, $\frac{39}{-21}$
   (ii) $\frac{1}{19}$, $\frac{19}{1}$
   (iii) $\frac{16}{8}$, $\frac{-64}{-32}$
   (iv) $\frac{3}{-8}$, $\frac{-6}{16}$

Q8 Find $x$ such that:
   (i) $\frac{15}{x} = -5$
(ii) $-18/3 = x/24$

Q9. Express the rational number in the standard form.

(i) $-144/-504$
(ii) $28/-119$
(iii) $-87/115$

Q10. Write True or false.

(i) $-1/2$ is a fraction.
(ii) $3 4/5$ is mixed number.
(iii) $44/132$ is equivalent to $2/3$
(iv) $1720/17200$ is equivalent to $1/10$. 
1. Represent the following rational numbers on the number line.

(i) \( \frac{9}{16} \)  
(ii) \( \frac{25}{-8} \)  
(iii) \( -\frac{13}{5} \)

2. Let O, P and Z represent the numbers 0, 5, and -7 respectively on the number line. Q, R, S and T are the points between O and P such that \( OQ = QR = RS = ST = TP \) and \( U \) is the point between O and Z such that \( OU = UZ \). What are the rational numbers represented by the points Q, R, S, T and U?

3. \( OA = AB = BC = CD = DE = EF = FG \) in the following number line.

What are the rational numbers represented by the points A, B, C, D, E, F?

4. Which of the rational numbers is greater?

(i). \( -\frac{2}{9} \) or 0  
(ii). \( 4/-3 \) or \( -\frac{9}{7} \)  
(iii). \( -11 \) or \( -\frac{16}{8} \)

5. Which of the rational numbers is smaller?

(i). \( -\frac{3}{5} \) or \( -\frac{27}{40} \)  
(ii). \( -\frac{19}{5} \) or \( -4 \)  
(iii). \( -\frac{17}{-9} \) or \( -\frac{19}{7} \)

6. Fill in the blanks with >, < or =.

(i) \( 5/-13 \) — \( -30/78 \)  
(ii) \( -1/2 \) — 0  
(iii) \( -35/45 \) — \( 63/-81 \)  
(iv) \( 0/100 \) — \( 21/19 \)  
(v) \( |-8/7| \) — \( |23/-21| \)

7. Write the absolute value of the rational number.

(i) \( |-101| = \)  
(ii) \( |0| = \)  
(iii) \( |16| = \) \( -19 \)

8. Arrange the rational numbers in the ascending order.

(i) \( -1/4, -5/-9, 0, 1/-3, -6/8 \)  
(ii) \( -3/10, 7/-15, -11/20, 17/-30 \)
## WORKSHEET 3

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<th>Gender</th>
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### Q1. Add

- **(i)** \[ \frac{-9}{16} \text{ and } \frac{21}{-16} \]
- **(ii)** \[ \frac{-23}{27} \text{ and } \frac{5}{27} \]
- **(iii)** \[ \frac{-31}{24} \text{ and } \frac{3}{-8} \]
- **(iv)** \[ \frac{19}{20} \text{ and } \frac{-15}{35} \]

### Q2. Simplify

- **(i)** \[ \frac{-4}{-19} + \frac{-2}{38} \]
- **(ii)** \[ -3 + \frac{1}{8} + \frac{-2}{5} \]
- **(iii)** \[ \frac{7}{-24} + \frac{-8}{3} + \frac{-9}{8} + (-16) \]
- **(iv)** \[ \frac{4}{9} + \frac{-17}{21} + \frac{-15}{7} + 0 + \frac{19}{3} \]

### Q3. Verify

- **(i)** \[ \frac{-16}{9} + (-4) = -4 + \left( \frac{-16}{9} \right) \]
- **(ii)** \[ 1 + \left( \frac{-5}{9} + \frac{7}{27} \right) = \left( \frac{1}{3} + \frac{-5}{9} \right) + \frac{7}{2} \]

205
WORKSHEET 4

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1. Find the difference

(i) \[-5 \quad 8\]

(ii) \[-13 \quad -19\]

2. What number should be added to \(-8\) so as to get \(-7\)?

3. What number should be subtracted from \(-23\) so as to get \(15\)?

4. Fill in the blanks:

(i) \(-5 \quad -4\) = 

(ii) \(-13 \quad + \quad = \quad 3\)

(iii) \(+ \quad 15\) = 4

4. Simplify:

(i) \(-7 \quad + \quad 4\) - \(1\)

(ii) \(-7 \quad + \quad 4\) - \(1\)

\(\frac{3}{6} + \quad \frac{8}{9} - \quad \frac{13}{12} - \quad \frac{11}{2}\)
WORKSHEET 5

Q1. Multiply
(i) \[22/27\] by \[-58/-2\]
(ii) \[-8/36\] by \[-9/16\]
(iii) 5/7 by \[-42/25\]
(iv) -13/9 by (-54)

Q2. Verify the property \(x \times y = y \times x\) by taking
(i). \(x=0\), \(y=-17/7\)
(ii). \(x=-13/8\), \(y=-5/9\)

Q3. Fill in the blanks:
(i). \(-9 \times 11/4 = 11/4 \times \) *
(ii). \(-6 \times -5/-17 = \) * -6

Q4. Verify the property \(x \times (y \times z) = (x \times y) \times z\) by taking
(i). \(x=-5/13\), \(y=-11/9\), \(z=6/7\)
(ii). \(x=-15/7\), \(y=-12/9\), \(z=-1/6\)

Q5. Fill in the blanks:
(i). \((-1) \times \) [7/11 \times 3/5] = \([-1 \times \) \] \times 3/5
(ii). \(1/2 \times \) [\(\) \times -26/15] = \([1/2 \times 13/4] \times -26/15
(iii). \([-15] \times \) [-8/19 \times \] = \([\) \times -8/19] \times 15/11
(iv). \([-9 \times -7/11] = \) [-6 \times \] -7/11

Q6. Verify the property \(x \times (y + z) = (x \times y) + (x \times z)\) by taking
(i). \(x=9/7\), \(y=-4\), \(z=-5/6\)
(ii). \(x=0\), \(y=15/7\), \(z=1\)

Q7. Fill in the blanks:
(i). \(-11/7 \times \) [7/15 = -8/9] = \([-11/7 \times 7/15] + [-11/7 \times \]
(ii). \(-16 \times \) [-13/11 + -4/5] = \([\) \times -13/11] + [-16/7 \times \]
(iii). \([-15] \times \) [-5/7 + 6/11] = \([\) \times -5/7] + [9/2 \times \]
(iv). \(-9 \times \) [3/-7 - 4/9] = \([\) \times -3/7] - [-9 \times \]

Q8. Write T or F:
(i). \(1 \times x\) is negative, if \(x\) is negative.
(ii). \(-1 \times (0 - y)\) is positive, if \(y\) is positive.
(iii). \(x \times (y - z)\) is zero, if \(y=z\.
(iv). \(x \times (y + z)\) is non-zero, if \(x\) is non-zero.
(v). Product of two rational numbers can never be an integer.
(vi). Product of two integers can be a fraction.
(vii). For a rational number 9, \(9 \times 7=7+7+7\ldots\ldots9\) times.

207
1. Find the reciprocal of:
   (i) -24
   (ii) -9/25
   (iii) |-9/16|
   (iv) 16/11 - 7/2
   (v) |4/5 - 3/2|
   (vi) (1/4)^-1

2. Verify that \((x + y)^{-1} \neq x^{-1} + y^{-1}\) by taking
   (i). \(x = 3/5, y = -6/7\)
   (ii). \(x = -8/15, y = -7/30\)

3. By taking (i) \(x = 9/12, y = 7/14\)  
   (ii) \(x = -2/16, y = 7/4\). Tell Is \((x - y)^{-1} = x^{-1} - y^{-1}\) or not ?

4. Verify that \((x \times y)^{-1} = x^{-1} \times y^{-1}\) By taking
   (i). \(x = 13/23, y = -15/4\)
   (ii). \(x = 17/13, y = -1\)

5. Verify that \((x + y)^{-1} = x^{-1} + y^{-1}\). By taking
   (i) \(x = 15/11, y = 12/25\)  
   (ii) \(x = 11/3, y = -17/26\)

6. Write T or F:
   (i) Reciprocal of \((2^{-1})^{-1}\) is 2
   (ii) Reciprocal of \((1/9^{-1})\) is 9
   (iii) For rational numbers \((9/7 + 2/13)^{-1} = (9/7)^{-1} + (2/13)^{-1}\)
   (iv) \((x + y)^{-1} = x^{-1} + y^{-1}\) is true for every non-zero rational number \(x\) and \(y\).
   (v) \((x \times y)^{-1} = x^{-1} \times y^{-1}\) is true only for \(x, y > 0\)
Q1. Find the value of:
   (i) $-15 + -\frac{12}{7}$
   (ii) $-\frac{1}{27} + -\frac{19}{3}$

Q2. The product of two rational numbers is $-\frac{14}{15}$. If one of the number is $-\frac{12}{7}$, find the other?

Q3. What number should we multiply to $-\frac{35}{27}$, so that the product be $-\frac{5}{9}$?

Q4. Taking $x = \frac{4}{19}$, $y = \frac{-13}{9}$, $z = \frac{5}{-13}$, Verify that $(x + y) x z \neq x + (y x z)$

Q5. Taking $x = \frac{9}{14}$, $y = \frac{-5}{36}$, $z = \frac{-7}{9}$, Tell if $x + (y + z) = x + y + x + z$

Q6. Taking $x = -\frac{6}{15}$, $y = -\frac{4}{35}$, and $z = \frac{2}{7}$, Tell if $(x + y) z = x + z + y + z$

Q7. State True or False.
   (i) $x + (y + z) = x + y + x + z$ is true for $y = z$.
   (ii) $(x - y) + z = x + z - y + z$ is true for all $z > 0$ and $z < 0$.
   (iii) $(x + x) x x = x$ for every non-zero rational number.
   (iv) For every non-zero rational number.

Q8. How many $\frac{4}{9}$ m long pieces can be cut from a rope which is 22m in length?

Q9. Divide the sum of $\frac{-13}{15}$ and $\frac{-11}{9}$ by the product of $\frac{-21}{17}$ and $\frac{1}{-9}$?
WORKSHEET 8

1. Find three rational numbers between
   (i) $-4/9$ and $|-4/9|$
   (ii) $-3/5$ and $3/5$
   (iii) $-27/14$ and $14/27$

2. For $x = -11/9$ and $y = 6/13$, is $|x - y| = |x| - |y|$ and $|x + y| = |x| + |y|$. If not then find the two rational numbers between $|x - y|$ & $|x| - |y|$ and $|x + y|$ & $|x| + |y|$.

3. Insert two rational numbers between $(x + y)^{-1}$ and $x^{-1} + y^{-1}$, where (i) $x = -9/7$ and $y = -11/5$
   (ii) $x = 2/5$ and $y = -3/7$

4. For each pair of above values in Q3, insert a rational number between $(x - y)^{-1}$ and $x^{-1} - y^{-1}$.

5. Write True or false.
   (i) Every rational number has a reciprocal.
   (ii) There are infinitely many rational numbers between two rational numbers.
   (iii) If $x > y$, then $|x| > |y|$.
   (iv) All rational numbers have positive absolute values.
   (v) $x + y$ is a rational number for all non-zero values of $y$. 

210
WORKSHEET 9

Q1. Convert the following rational numbers into decimals
   (i) 25/4   (ii) 50/30   (iii) -21/20   (iv) 321/200   (v) -480/16   (vi) 13.5/2.1

Q2. Express as non-terminating repeating decimals.
   (i) 15/35   (ii) -2/13   (iii) -20/6   (iv) 47/70

Q3. Which of the following are the terminating or non-terminating repeating decimals. Tell why? (without actually dividing)
   (i) 15 + 17 =
   (ii) 42 ÷ 25 =
   (iii) 3/20 =
   (iv) 0.58 ÷ 0.12 =
   (v) 12.5 ÷ 4 =
   (vi) 24 ÷ 0.7 =

Q4. Write True or False.
   (i) p/q has a terminating decimal representation if q is any prime number.
   (ii) If p/q and r/s are terminating decimals then p/q + r/s will also be a terminating decimal.
   (iii) If p/q and r/s both have non-terminating repeating decimal representation, so does p/q + r/s.
   (iv) If p/q and r/s both have non-terminating repeating decimal representation, so does p/q x r/s.
   (v) If p/q and r/s both have terminating decimal representation, so does p/q + r/s.
1. Convert the following decimals into rational numbers.
   (i) 0.365
   (ii) 8.62
   (iii) -356.009
   (iv) 2.0009

2. Find the value and express the result as a rational number.
   (i) $679.5 - (67.94 - 8.794)$
   (ii) $(3.25 - 0.78) - (18.2 - 19.25)$
   (iii) $1.18 - 0.24$

3. Evaluate and express the result as $\frac{p}{q}$
   (i) $(2.1)^3 \times (0.5)^2$
   (ii) $0.07 \times 0.007 \times 0.0007$

4. Evaluate and express the resulting number as a rational number.
   (i) $6.9 + (1.3)^2$
   (ii) $(2.2)^2 \times (0.5)^2 + 1000$
   (iii) $4.25 + 2.5 \times 0.9$
Q1. Express as a rational number \( p/q \)
   (i) \([-2/9]^4\]
   (ii) \([-4/5]^5\]
   (iii) \([-7/9]^3\]

Q2. Simplify
   (i) \(\left(\frac{-4}{9}\right)^3 \times \left(\frac{-5}{7}\right)^3\)
   (ii) \((-4)^3 \times \left(\frac{11}{2}\right)^3\)
   (iii) \((-6)^6 + \left(\frac{-1}{3}\right)^3\)
   (iv) \(\left(\frac{1}{7}\right)^3 + \left(\frac{1}{35}\right)^3\)

Q3. Express in power notation.
   (i) \(-32\)
      \[\frac{243}{1}\]
   (ii) \(-2187\)
      \[\frac{78125}{1}\]
   (iii) \(-16\)
      \[\frac{14641}{1}\]

Q4. Simplify:
   (i) \((7^2 - 5^2) + \left(\frac{1}{5}\right)^2 - \left(\frac{1}{3}\right)^2\)
(ii) \[
\left( \frac{11}{6} \right)^2 \cdot \left( \frac{7}{3} \right)^4 \times (7^3 - 5^3)
\]

(iii) \[
\left( \frac{-1}{4} \right)^3 \times (3)^3 \times \left( \frac{4}{9} \right)^3
\]

(iv) \[
\left( \frac{-3}{6} \right)^2 \times (-4)^3 \times \left( \frac{7}{6} \right)^3
\]
Q1. Find the reciprocal of the following and express
   
   (i) \(-\frac{729}{64}\) as a power of \(\frac{-4}{9}\)

   (ii) \(\frac{625}{64}\) as a power of \(\frac{8}{25}\)

   (iii) \(-\frac{3125}{32}\) as a power of \(\frac{-2}{5}\)

   (iv) \(-\frac{81}{216}\) as a power of \(\frac{-6}{3}\)

Q2. Find the absolute value of
   
   (i) \(\left(\frac{-2}{7}\right)^3\)  (ii) \(\left(\frac{5}{-3}\right)^6\)  (iii) \(-\left(\frac{4}{5}\right)^2\)  (iv) \(\left(\frac{-1}{4}\right)^5 + \left(\frac{1}{4}\right)^5\)

Q3. Distinguish between the rational numbers \(\frac{2^3}{3}\) and \(\left(\frac{2}{3}\right)^3\). Which is smaller of the two? Insert 5 rational numbers between \(\frac{2^3}{3}\) and \(\left(\frac{2}{3}\right)^3\).
WORKSHEET 13

Q1. Simplify and express the result in power notation.

(i) \( \left( \frac{11}{3} \right)^{11} \times \left( \frac{11}{3} \right)^4 \)

(ii) \( \left( -\frac{4}{9} \right)^3 + \left( -\frac{4}{9} \right)^7 \)

(iii) \( \left( \frac{1}{3} \right)^2 \times \left( -\frac{1}{3} \right)^3 \)

(iv) \((-3)^8 + (-3)^{12}\)

(v) \(\left( \frac{1}{3^2} \right)^4\)

(vi) \(\left( \frac{-7}{11} \right)^3 \times \left( -\frac{1}{3} \right)^2\)

Q2. Simplify:

(i) \(\left( -\frac{2}{3} \right)^6 + \left( -\frac{2}{3} \right)^3\)

(ii) \((-9)^8 + (-9)^5\)

(iii) \(\left( -\frac{1}{6^3} \right)^2\)

Q3. Fill in the blanks:

(i) \((-3)^4 \times (-3)^3 = (-3)^\_

(ii) \((-5)^6 + (-5)^3 = (-5)\_

(iii) \(\left( \frac{6}{7} \right)^8 \times \left( \frac{6}{7} \right)^4 = \left( \frac{6}{7} \right)^\_

(iv) \((-6)^{11} + (-6)^{15} = \left( \frac{1}{-6} \right)^\_

(v) \(6^{13} + 6^{20} = \left( \frac{1}{6} \right)^\_

(vi) \(\left( \frac{-7}{80} \right)^{80} = \left( \frac{7}{80} \right)^\_

(vii) \((20 \times 20)^2 = (20)^\_

(viii) \((10^{10})^{10} = 10^\_

(ix) \text{Reciprocal of } \left( \frac{6}{7} \right)^{25} \text{ is } \_

(x) \text{Reciprocal of } \left( \frac{1}{7} \right)^7 \text{ is } \_

216
Q1. Find the value of:

(i) \(-\frac{6}{11}\)^{-3}  
(ii) \(-\frac{8}{11}\)^{-2}  
(iii) \(\frac{4}{9}\)^{-3}  
(iv) \(\frac{-5}{4}\)^{-4}

Q2. Express each of the following as a rational number with positive exponent.

(i) \((2^{-4})^3\)  
(ii) \((3^{-3} \times (-7)^{-3}\)  
(iii) \(6^3 \times 6^{-5}\)

(iv) \((3^5 + 3^8) \times 3^{-7}\)  
(v) \(\left(\frac{11}{4}\right)^{-4}\)  
(vi) \(\left(\frac{8}{5}\right)^2\)^{3}

Q3. Express each of the following as a rational number with negative exponent.

(i) \((3^4)^2\)  
(ii) \(5^3 \times 5^2\)  
(iii) \((-7)^4 \times \left(\frac{11}{7}\right)^{4}\)

(iv) \((9^7 + 9^3) \times 9^3\)  
(iv) \(\left(\frac{-11}{5}\right)^{3}\)

Q4. Find the value of:

(i) \((-4)^0\)  
(ii) \(6^{7-7}\)  
(iii) \((-4)^4 \times 5 \times 8^{-12}\)

(iv) \(7^0 + (-9)^0 + 2^0\)  
(v) \((4^0 - 3^0) \times (4^0 + 3^0)\)  
(vi) \(3^0 \times \left(\frac{-1}{2}\right)^0 \times \left(\frac{1}{4}\right)^0\)  
(vii) \(\left(\frac{1}{2}\right)^7 + \left(\frac{8}{9}\right)^0 \times \left(\frac{2}{3}\right)^0\)

Q5. By what number should we multiply \(\frac{1}{2}\) so that the product may be equal to 2 ?

Q6. By what number should \(\frac{-11}{4}\) be divided so that the quotient may be equal to \((-4)^{-3}\) ?
Q7. Find x so that \( \left( \frac{16}{9} \right)^{-11} \times \left( \frac{16}{9} \right)^4 = \left( \frac{16}{9} \right)^{3x} \)

Q8. Find y so that \( \left( \frac{14}{5} \right)^{-3} \times \left( \frac{14}{5} \right)^{-9} = \left( \frac{14}{5} \right)^{2 + y - 1} \)
Q1. If \( \frac{m}{n} = \left( \frac{2}{3} \right)^3 + \left( \frac{6}{8} \right)^0 \), find the value of \( \left( \frac{m}{n} \right)^{-3} \).

Q2. If \( \frac{x}{y} = (-3)^3 \times 5 - 6 - 9 + (3^0 + 2^0) \), find the value of \( \left( \frac{x}{y} \right)^{-2} \).

Q3. Simplify \( \left( \frac{5}{6} \right)^2 \times \left( \frac{1}{2} \right)^{-2} \times (2)^{-1} \times \left( \frac{1}{6} \right)^2 \).

Q4. Show that:
   
   (i) \( \left( \frac{-13}{17} \times \frac{6}{-11} \right)^{-8} = \left( \frac{-17}{13} \times \frac{11}{-6} \right)^8 \)
   
   (ii) \( \left( \frac{-14}{19} \times \frac{-26}{52} \times \frac{9}{13} \right)^{-7} = \left( \frac{19}{14} \times \frac{13}{9} \times \frac{52}{26} \right)^7 \)

Q5. Write true or false.
   
   (i). For all integers \( a \) and \( b \), \( (a + b)^2 > a^2 + b^2 \) and \( (a - b)^2 < a^2 + b^2 \)
   
   (ii). Relation \( x^m + x^n = x^{m+n} \) is true if \( x > 0 \) and \( m < n \).
   
   (iii) \( x^m \times x^n = x^{m+n} \) is true for all non-zero rational numbers and \( m \) and \( n \) are any integers.
   
   (iv). \( \frac{1}{x^0} = 1 \) for all values of \( x \).
   
   (v). Reciprocal of \( (x)^m = \frac{1}{x^m} \)
   
   (vi) \( (x \times y)^m = \frac{1}{x^m \times y^n} \) for all non-zero values of \( x \) and \( y \).
Q1. Express the following numbers in the form of \( k \times 10^n \) with the given value of \( n \).
(i) \( 125000000 \), \( n = 8 \)
(ii) \( 69200000000000000 \), \( n = 16 \& 17 \)
(iii) \( 0.00000000000890 \), \( n = -10, -11, -12 \)

Q2. Write the following numbers in the usual form.
(i) \( 9.2486789 \times 10^9 \)
(ii) \( 4.26 \times 10^{12} \)
(iii) \( 9.2 \times 10^{-12} \)
(iv) \( 650 \times 10^{-8} \)

Q3. Express the numbers in the following statements in the form \( k \times 10^n \), where \( 1 \leq k < 10 \) and \( n \) is an integer.
(i). \( 1 \text{pm} = \frac{1}{1000000000000} = \frac{1}{10^{12}} \)
(ii). \( 1 \text{ billion} = \frac{1}{1000000000000000} \)
(iii). \( 98 \text{ crore} = \frac{98}{1000000000} \)
Q1. Replace each * in the following tables by a suitable number, if x and y vary directly.

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</tr>
</tbody>
</table>

Q2. In a ground, if 18 students can sit on 3 benches. How many benches are needed for 540 students?

Q3. If cost of 27m of cloth is Rs 1350. What length of this cloth can be purchased for Rs 2275?

Q4. At a particular time of the day, a 20.5m high building casts a shadow which is 24m long. What is the height of a tomb which casts a shadow of 60m in length at the same moment?

Q5. A worker is paid Rs847 for working 7 days. If his total wages during a month are Rs 3146, for how many days did he work?
1. Which of the following vary directly?
   (i) The speed(x) of a train and time taken(y) by the train.
   (ii) The number(x) of persons hired to construct a road and the time taken(y) to finish the job.
   (iii) The bottles of soft-drink(x) served to the number(y) of the people in a party.
   (iv) The number(x) of note-books and their cost(y).
   (v) The number of uniform iron rods(x) and their weight(y).

2. If x and y vary directly, when x is 13 & y is 26, then which of the following is not a possible pair of corresponding values of x and y?
   (i) 1 and 2
   (ii) 32 and 64
   (iii) 25.1 and 50.25
   (iv) 2.75 and 5.50
   (v) \( \frac{11}{44} \) and \( \frac{11}{88} \)

3. If x and y vary inversely, when x is 12 and y is 6. Which of the following is a possible pair of corresponding values of x and y?
   (i) 13 and 5.50
   (ii) 0.8 and 90
   (iii) 0.36 and 20
   (iv) 0.45 and 1.3
   (v) 42 and 1.6

4. A motorist can finish a certain distance in 10 hours and a half at the speed of 80 km/hr. By how much should its speed be increased so that it may take only 8 hours to cover the same distance?

5. A army camp of 100 men has provision for 30 days. However, 300 men arrived. For how many days will the food last now?
Q1. If 36 men can till a piece of land in 15 and half days, how long will 26 men take to till a same piece of land?

Q2. Rajeev drives at an average speed of 60 km/hr to reach office. It takes him 20 minutes. If he wants to reach his office in 15 minutes, what should be his average speed?

Q3. Gautam has just enough money to buy 15 pens worth Rs 20 each. If each pen were to cost Rs less, then how many pens would he be able to buy with that amount of money?

Q4. The following readings on Pressure (P) and volume (V) at a constant temperature of a gas were recorded. Assuming that P varies inversely as V, find the missing terms in the table.

<table>
<thead>
<tr>
<th>Pressure (in cm)</th>
<th>76.00</th>
<th>80.00</th>
<th>___</th>
<th>220.45</th>
<th>___</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volume (in ml)</td>
<td>12.50</td>
<td>___</td>
<td>15.25</td>
<td>___</td>
<td>40</td>
</tr>
</tbody>
</table>

Q5. The following readings on volume (V) and absolute temperature (T) at a constant pressure of Gas were recorded. Assuming that V varies directly as T, find the missing terms in the table.

<table>
<thead>
<tr>
<th>Volume (in ml)</th>
<th>76.00</th>
<th>80.00</th>
<th>___</th>
<th>220.45</th>
<th>___</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absolute temperature (T)</td>
<td>12.50</td>
<td>___</td>
<td>15.25</td>
<td>___</td>
<td>40</td>
</tr>
</tbody>
</table>
6. A stock of rice is enough for 675 persons for 10 weeks. How long will the same stock last for 450 persons?

7. A rider covers a distance of 17 km in two and half hours on a horse. What is the average speed of a horse?
Q1. A contractor employed 215 men to build a hotel in 55 days. After 10 days, he was joined by 7 more men. In how many days will the remaining work be finished?

Q2. 45 cows can graze a field in 15 days. How many cows will graze the same field in 12 days?

Q3. A boy can finish a book in 30 days if he reads 22 pages of it every day. How many pages he to read if the book is finished in 25 days?

Q4. 20 men can repair a broken bridge in 4 days. How many days will it take if 80 men do the same?
5. Working 8 hours a day, a typist can type the book in 19 days. How many hours a day should he work so as to finish the work in 16 days?

6. A 250m long train is running at a speed of 55.5km/hr. In how much time will it cross a tree which is at a distance of 60m from a platform of length 520m?

7. A train moving at a speed of 65km/hr covers a certain distance in 5.5 hours. What should be the speed of the train to cover the same distance in 4 hours?
WORKSHEET 21

Name

Class

Roll No.

School

Gender

Q1. Convert into percent
   (i) 7 : 12
   (ii) 0.75
   (iii) 

Q2. Find the quantity b, if 3.4% of b is 68

Q3. The cost of car was Rs 67000 in March. It was 10% more in April. What was the cost of the car in April?

Q4. Neha spends 25% of her salary on food, 5% on clothing. If she spends Rs 1500 on these two
   How much amount will be left with her?

Q5. An ore contains 36% of copper, 32% of iron and rest is zinc. Find the amount of copper, iron
   zinc in 1kg of ore?

Q6. In annual exams, 92% of total students passed. If the number of failed students are 32, find
   number of students who appeared in the examination?

Q7. Pawan's father purchased a house for Rs 54000. He made cash payment of 40% of the cost
   paid the rest of amount in 5 equal instalments. How much money was paid as cash? What a
   did he pay in each instalment?

227
1. Complete the following table (wherever possible)

<table>
<thead>
<tr>
<th>Purchased at</th>
<th>Overhead expenses</th>
<th>C. P</th>
<th>S.P</th>
<th>Profit</th>
<th>Loss</th>
<th>Profit%</th>
<th>Loss%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rs 28000</td>
<td>Rs 2000</td>
<td></td>
<td>Rs 3600</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>Rs 500</td>
<td>Rs 900</td>
<td></td>
<td>8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rs 240</td>
<td>Rs 10</td>
<td></td>
<td></td>
<td>6</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. In which of the following situations a loss is incurred?
   a. Buying an old house for Rs 37500, spending Rs 5500 on its repairs and then selling it for Rs 42000.
   b. Buying 100Kg of apples for Rs 350 and selling them at the rate of Rs 4 per Kg.

3. Bashir bought an article for Rs 2225 and Rs 75 on its transportation. He sold it for Rs 2250. Find his gain or loss percent.

4. A shopkeeper bought 15 tables at the rate of Rs 50 each & 15 chairs at the rate of Rs 30 each. He spent Rs 50 on transportation. He sold the tables and chairs at the flat rate of Rs 40 each. Find his gain% or loss% in the transaction.

5. A shopkeeper loses 5% by selling a watch for Rs 1140. For how much he sell it to gain 5%?

6. By selling a computer for Rs 20000, a man gains 5%. Find the cost – price.
Q1. Find the unknown quantity in each case.
   (i) Principal = Rs 2850, Rate of interest per annum = 3 — %, Time period = 8 months, Interest = 2
   (ii) Principal = Rs 480, Time period = 8 months, Rate of interest = 2 — % per annum
   Interest = ______ , Amount = ______
   (iii) Principal = Rs 500, Time period = 3 years, Rate of interest = ______ , Interest = ______ ,
   Amount = Rs 650

Q2. Find Principal when Simple Interest = Rs 72, Rate = 3% per annum and Time = 3 months.

Q3. Find Rate when Principal = Rs 700, Simple Interest = Rs 168 and Time = 16 months.

Q4. Dev borrowed Rs 6000 from the S.B.I. for 3 years 8 months at the rate of 13% per annum. What
amount will clear off her debt?

Q5. A sum of Rs 450 amounts to Rs 576 after a certain period of time at the rate of 8% per annum, Find
the time.

Q6. A sum of money at simple interest doubles itself in 10 years. Find the rate percent per annum?
1. Multiply the monomials.

(i) \( \frac{2}{5} x^2yz^2 \) and \( \frac{-6}{11} x^2y^3z \)

(ii) \( 0.25x^2y \) and \( 0.37xyz^2 \)

(iii) \( 11.2pqr \) and \( 9.0p^2q \)

(iv) \( 4ab \) and \( \frac{b^2c}{9} \)

2. Find the product.

(i) \( \frac{3}{9} axy \) \( \left( \frac{-9}{21} a^2y^2x^2 \right) \left( \frac{-4}{3} a^3y^3x^3 \right) = \)

(ii) \( (0.1xy)(0.01yz)(0.001x^2y^2z^2) = \)

(iii) \( (0.8xyz)(-0.2x^2y^3)(3y^2z^2) = \)

3. Express each of the following as a monomial.

(i) \( (c^3)(-c^2a^3d^3)(a^2b^3c^2) = \)

(ii) \( (a^{36}b^{41})(a^{22}d^{26})(b^{20}c^{40})(d^{44}a^{20}) = \)

(iii) \( (a^{2001})(b^{989})(c^{492})(a^3b^2c^9)(0) = \)

4. Multiply the monomials \( b^{10} \) \( \frac{1}{4} a^4 \) and \( -100c \). Verify your result for \( a = -2 \), \( b = 1 \) and \( c = -2 \).

5. Multiply \( 0.4x^2y^2 \) and \( -1000y^2z \). Verify your result for \( x = 0.1 \), \( y = -0.01 \) and \( z = 0.001 \).

6. Find the value of \( (36b^7)(-100a^{10}b)(0.2a^3b^5) \) at \( a = 1 \) and \( b = \frac{1}{2} \). after expressing it as monomial.
Q1. Evaluate the product of $7.9x^3$, $8.2y^4$ and $2.9x^3y^3z$ when $x = 2$, $y = -1$ and $z = 0.3$.

Q2. Simplify:
(i) $\left( \frac{9}{16} a^2bc \right) \left( \frac{40b^3c^3}{100} \right) \left( \frac{-8}{100} d^2 \right)

(ii) $(-2.8) (9.2x^2y^2z) (0.01x^3z^2)$

Q3. Verify that the following relation is true by expressing each side as a monomial.

$$\left( \frac{-9}{200} p^{\text{100}q^{\text{100}r^{\text{500}}}} \right) = \left( \frac{-9}{200} p^{\text{100}q^{\text{100}r^{\text{500}}}} \right) (4pq^2)$$

Q4. Find two monomials with positive integer coefficients whose product is the given monomial.
(i) $8pqr = \frac{-9}{200} p^{\text{100}q^{\text{100}r^{\text{500}}}}$
(ii) $a^3bc = \frac{-9}{200} p^{\text{100}q^{\text{100}r^{\text{500}}}}$

Q5. What do the following products represent geometrically?
(i) $6p \times 7q$
(ii) $10 \times 5p$
1. Find the numerical coefficient in the product of
   (i) \(12ab^2cd\), \(10.5c^2d^2\) and \(2a^3b^2\) = ______________
   (ii) \(-11a^4b^5c^3\), \(11.2a6c^{11}d^{12}\) and \(-100a^{15}b^{10}c^{12}\) = ______________

2. Find the literal part in the product of
   (i) \(-2.981a^4b^2\), \(-21.472b^6c^{10}\) and \(212.7894a^8b^2\) = ______________
   (ii) \(\frac{a^3bc}{921}\), \(\frac{b^5c^4}{1982}\) and \(\frac{a^3c^7}{391}\) = ______________

3. Multiply
   (i) \(-8a^3b^2 - 29b^5c^2\) by \(4bcd^2\)
   (ii) \(\frac{4}{9}pq\) by \(\left(\frac{9}{4}p^2q^2r - \frac{18}{27}pqr^3\right)\)
   (iii) \((39y + 0.3x)\) by \(-2xy\)

4. Evaluate at \(a = -1\) and \(b = 0.1\)
   (i) \((a^3b - 0.71ab^2)(1.31a^3)\)
   (ii) \((-3.9a^3b^2)(0.34ab^2 - 0.4a^2)\)
Q5. Multiply and verify the result for \( x = 0.2, y = -0.1 \) and \( z = -1 \).

(i) \[
\frac{1}{2} x^2 y^3 z^3 (x^3 - 2y^3)
\]

(ii) \[
(xz^3 - x^6 y^3 z^4) (0) (x^3 z^3)
\]

Q6. Simplify:

(i). \[
(a^3 + b^2 a^4 - 1) a^3 b + (a^3 b - a^7 b^3) (1 + a^2 b)
\]

(ii). \[
9x^4 - 6x^2 (x^2 - 2) + 4x (-3x + 2x^3)
\]
1. Express in the form of a single algebraic expression.
   (i) \((3x^2 + 4y^3)(2x^2y - 2y^4 + 4)\)
   (ii) \((x^2 - 2y)(-2y + 4z) + 2yx^2\)
   (iii) \((2x + y)(2y - z) + (2y + z)(2x - y) + (4xy + yz)\)
   (iv) \((p^6 + 5q^3)(r^3 + 1 - 4q^3)\)
   (v) \((a^2 + b^2 + c^2)(b^3 - c^3)\)

2. Simplify and verify the results for \(x = -1\), \(y = 0.1\) and \(z = 2\).
   (i) \(3x - \frac{1}{3}y \times \begin{pmatrix} \frac{7}{9}x^2 - 2y + 3 \end{pmatrix}\)
   (ii) \((x^2 + y^2 - z^2) + y^2(2x + y - z^3) - z^2(x - y^2)\)
   (iii) \((1.5x - 0.5yz)(0.5x + 0.5y + 7.5)\)
   (iv) \(1.5x^2 + (2x + 0.7y)(7y + 0.5z)\)
Q1. Use a suitable identity to find the product.

(i). \((1.2x + 2.3)(1.2x + 2.3)\)

(ii). \(\left(\frac{2}{3}x^3 + \frac{9}{4}y^3\right)\left(\frac{2}{3}x^3 + \frac{9}{4}y^3\right)\)

(iii). \(\left(\frac{5}{9}x - \frac{2}{7}y\right)\left(\frac{5}{9}x - \frac{2}{7}y\right)\)

(iv). \((-8x + 7y)(8x + 7y)\)

(v). \((4m^3 + 11n^3)(4m^3 - 11n^3)\)

(vi). \((2.5p^3 + 0.5q^2)(2.5p^3 - 0.5q^2)\)

(vii). \((7a^3 - 5b^3)^2\)
Q2. Simplify and express as a monomial or a binomial.

(i). \((200a^2 + 10b)^2 - (200a^2 - 10b)^2\)

(ii). \(\left(\frac{9}{200}p^3 - \frac{1}{400}q^2\right) - \left(\frac{9}{200}p^3 - \frac{1}{400}q^2\right)^2\)

(iii). \((a^3 - b^2a)^2 + 2a^4b^2\)
Q1. Evaluate each of the following by using a suitable identity.
(i). \(999^2\)

(ii). \(1001^2\)

(iii). \(495^2\)

(iv). \(9.9^2\)

Q2. Simplify by expressing as the difference of two squares.
(i). \(103 \times 97\)

(ii). \(991 \times 1009\)

(iii). \(10.7 \times 9.3\)

Q3. Simplify without as such calculating the square of any number.
(i). \(301^2 - 189^2\)

(ii). \(991^2 - 981^2\)
4. Find the value of \( x \), if
(i). \( (2p^2 + 4q)^2 - (2p^2 - 4q)^2 = p^2q^2a \)

(ii). \( 7a = 45^2 - 38^2 \)

5. Arrange the following pieces to form a square.
One 4 x 4 square piece, one 6 x 6 square piece and two 4 x 6 rectangular pieces.
Q1. Find the highest common factors of monomials and expressions.
   (i) $21x^2yz$ and $56x^3y^2z^2$
   (ii) $12p^2q^3, 23p^2qr$ and $31p^2q^3$
   (iii) $4x^2y^2z^2 - 64x^2y^2z^2 - 32x^2yz^2$
   (iv) $6x^2 + 36x + 42$

Q2. Factorize the following binomials.
   (i) $-14a^3 + 21a$
   (ii) $45p^2q^2 + 36pqr$
   (iii) $9a^2b^2 - 6ab^2$
   (iv) $x^4y^4 - 81$
   (v) $(x + 2y)^2 - 4z^2$

Q3. Find the factors of each of the following expressions.
   (i) $21x^2yz^3 - 105xy^2z^2 - 35x^3y^2z$
   (ii) $a^7b^5c^7 + a^4b^2c^5 + a^3b^3c^3$
   (iii) $1.5x^2y^2 - 0.75x^2y^3 + 45xy^2$
1. Express as the square of an expression and hence factorise.
   (i). $4a^4b^2 + 72a^2b^3c^2 + 81c^4$
   (ii). $100m^2n^4 - 180mn^2 + 9$
   (iii). $121x^4 - 88x^3y + 16x^2y^2$

2. Factorize.
   (i). $(x^3 - y^3)^2 - (x^3 + y^3)^2$
   (ii). $a(a + b) - 14a - 14b$
   (iii). $x^2(x - 5) - 12x + 60$
   (iv). $(18ab - 12a) + 24b - 16$

3. Factorize.
   (i). $(36x^2 + 9y^2 - 36xy) - 81z^2$
   (ii). $(xy + 2x) + y + 2$
Q4. Find the factors of the least possible degree.

(i). \(81x^4 - (y + z)^4\)

(ii). \(1000m^4 - 64n^4\)

(iii). \(a^4 - (3b + 2c)^4\)
1. Fill in the blanks:
   (i) Sum of the three angles of a triangle is ______
   (ii) A triangle has ___ angles and ___ sides.
   (iii) When one of the angle of triangle is > 90° then triangle is said to be _______ triangle.
   (iv) In equilateral triangle all angles are equal to ______.
   (v) When all the three sides of triangle are equal, triangle is called ______.
   (vi) When all the three sides of a triangle are unequal then triangle is called _______.
   (vii) In isosceles triangle __________ sides are equal.
   (viii) Sum of any two sides of a triangle is _______ than the third side. (greater, smaller)
      \[
      \begin{align*}
      \text{The value of } x^0 & \quad \text{______}
      \end{align*}
      \]

2. Construct a triangle PQR in which \( \angle Q = 75^0 \), PQ = 3.6cm, QR = 5.8cm.

3. Construct a isosceles triangle ROS in which OS = SR = 5.4cm and \( \angle S = 45^0 \).

4. Construct a \( \triangle RST \) in which RS = 4.5cm, \( \angle R = 60^0 \) and \( \angle S = 45^0 \).

5. Construct a \( \triangle LMN \), LM = 4.3cm, \( \angle L = 70^0 \), \( \angle N = 30^0 \).
Q1. Construct a $\triangle XYZ$, $XY = 6.2\text{cm}$, $YZ = 7.2\text{cm}$ and $XZ = 4.2\text{cm}$.

Q2. Construct an equilateral triangle of side $3.6\text{cm}$.

Q3. Construct a right triangle with hypotenuse of length $6\text{cm}$ and one side is of length $4\text{cm}$.

Q4. Construct a right triangle $\triangle DEF$ in which $\angle E = 90^0$, $EF = 3.5\text{cm}$ and $DF = 5.6\text{cm}$.

Q5. Construct an isosceles right triangle $\triangle PQR$ in which $\angle Q = 90^0$ and $PQ = QR = 5\text{cm}$.

Q6. Which of these triangles can be constructed? Give reasons.

(i) $\angle P = 110^0$, $\angle Q = 95^0$, $PQ = 4\text{cm}$

(ii) $\angle D = 80^0$, $\angle E = 50^0$, $DE = 4.2\text{cm}$

(iii) $AB = 3\text{cm}$, $BC = 2\text{cm}$, $AC = 5\text{cm}$

(iv) $PQ = 4\text{cm}$, $QR = 3\text{cm}$, $PR = 6\text{cm}$

(v) $\angle X = 90^0$, $\angle Y = 90^0$, $XY = 5.4\text{cm}$
1. If \( \angle A = \angle C \) then which of the two sides are equal?

2. In the adjoining figure, \( \triangle ABC \) is isosceles with \( AB = AC \) and \( \angle A = 400 \), find the other two angles.

3. In \( \triangle DEF \), \( DE = EF \), if \( \angle D = 46^0 \), what is the measure of \( \angle F \)?

4. Find the value of \( x^0 \) and \( y^0 \) in the given figure, where \( \triangle ABC \) is isosceles with \( AB = AC \) and \( \angle B = 46^0 \).

5. In the given figure, equal sides have been shown with similar markings. Find \( \angle PQR \) and \( \angle PRQ \).

6. In the figure given below, equal sides have been shown with similar markings. Find the values of (i) \( x \) (ii) \( y \) (iii) \( z \) (iv) \( t \) Given reasons.
Q1. In the Fig. 32.1, \( \triangle ABC \) and \( \triangle DBC \) are isosceles with common BC. The equal sides have been shown by similar markings. If \( \angle BAC = 45^\circ \) and \( \angle DBC = 70^\circ \).

Find (i) \( \angle ABC \) and \( \angle ACB \)
(ii) \( \angle BDC \) and \( \angle BCD \)
(iii) \( \angle ABD \) and \( \angle ACD \)

Q2. In Fig. 32.2, \( \triangle ABC \) is isosceles with \( AB = AC \). If exterior angle \( \angle BAD \) is \( 90^\circ \). Find the other angles of \( \triangle ABC \).

Q3. \( \triangle PQR \) is isosceles with \( PQ = PR \). If \( \angle P \) is thrice the measure of \( \angle R \), find the measure all angles of triangle.

Q4. In Fig 33.3, \( \triangle ABC \) is isosceles with \( AB = AC \). \( DE \parallel BC \), \( \angle ADE = 60^\circ \)

Find (i) \( \angle AED \)
(ii) \( \angle ABC \)
(iii) \( \angle ACB \)
(iv) \( \angle ABF \)

Is \( \triangle ADE \) isosceles ?

Q5. In \( \triangle ABC \), \( \angle ABC = 60^\circ \), \( \angle ACB = 70^\circ \).

(i) Which angle is the greatest ?
(ii) Which side is the shortest ?
1. Fill in the blanks:

(i) If \( \triangle ABC \) is right angled at \( C \), the possible hypotenuse is \_\_\_\_\_.

(ii) In right triangle, \_\_\_\_\_ is the longest side.

(iii) In right angled triangle \( DEF \), \( x, y \) are sides and \( z \) is hypotenuse then \( z^2 = \_\_\_\_\_\_\_\_\_\_\_\_\_\_ \).

(iv) If a triangle satisfies Pythagoras theorem then the triangle is \_\_\_\_\_\_\_\_\_\_\_\_\_\_.

2. \( \triangle PQR \) is right angled at \( P \). If \( PQ = 5 \text{cm}, PR = 10 \text{cm}, \) find the length of \( QR \). What is \( QR \) called?

3. The hypotenuse of the right triangle is 9.5cm. If one of the side is 3.7cm, find the other side?

4. The sides of a triangle are 12.5cm, 8cm and 14.5cm. Is this triangle right triangle?

5. The man walks 15.5m towards east, then he walks 12m towards north. Find the distance between the starting point and the present position?

6. If the square of the hypotenuse is 32cm\(^2\), find the length of each side.

7. Which of following is the Pythagorean triplet?
   (i) 3, 4, 5
   (ii) 29, 11, 31
   (iii) 20, 30, 40
Q1. Draw a \( \triangle ABC \) in which BC = 6.5cm, AB = 5.5cm and AC = 4.5cm. Draw its medians AD, BE and CF. (i). Do they intersect at a point? If yes, mark the point. (ii). Are D, E and F, the points of BC, AC and AB respectively?

Q2. Construct a \( \triangle ABC \) in which BC = 5cm, \( \angle B = \angle C = 70^\circ \). Draw medians to the two equal sides. Measure the lengths of the medians. Are they equal?

Q3. Draw an equilateral triangle each of whose sides is 6cm. Draw its three medians. Are they equal?

Q4. Fill in the blanks:

(i) The median is a ______ that joins a vertex of a triangle to the ______ of the opposite side of the triangle.

(ii) A triangle has ______ medians.

(iii) The medians of triangle are ______ .

(iv) The medians drawn to the two equal sides of isosceles triangle are ______ .

(v) All three medians of ______ triangle are equal.

(vi) The point of concurrence of the medians of a triangle is called the ______ .

(vii) The centroid always lie in the ______ of the triangle.
1. Draw a triangle ABC where BC = 5.6 cm, $\angle B = 60^0$, $\angle C = 45^0$. Draw its altitudes BE, CF to the lines containing the opposite sides, which meet at M. Join AM, meeting BC at D.

2. Draw a triangle ABC, where $\angle B = 115^0$, BC = 5.2 cm, AB = 6 cm. Draw its altitudes and locate its orthocenter. Where does its orthocenter lies?

3. Draw a triangle DEF where $\angle E = 90^0$, EF = 4.5 cm and DF = 5.6 cm. Name its orthocenter without drawing any altitude?

4. Fill in the blanks:

   (i). An altitude of a triangle is a ______ from a vertex ______ to the opposite side.
   (ii). The point of concurrence of the altitudes of a triangle is called its ________.
   (iii). If $\triangle PQR$ is right angled at P, then____ and ______ are two altitudes of the triangle.
   (iv). If $\triangle ABC$ is acute angled triangle, the orthocenter lie ________ the triangle.

   (v). If $\triangle ABC$ is _________ angled triangle, the orthocenter lie outside the triangle.
Q1. Draw a $\triangle ABC$, with $\angle A = 70^\circ$, $\angle B = 50^\circ$ and $AC = 7\text{cm}$. Locate its circumcentre.

Q2. Draw a $\triangle PQR$ where $\angle Q = 90^\circ$, $QR = 6\text{cm}$ and $PQ = 7.5\text{cm}$. Locate its circumcentre. Where does it lie?

Q3. Draw a $\triangle DEF$ where $\angle D = 105^\circ$, $DE = 4.5\text{cm}$ and $DF = 5.6\text{cm}$. Locate its circumcentre.

Q4. Draw an isosceles $\triangle ABC$ with $AB = AC = 5\text{cm}$ and $BC = 7.5\text{cm}$. Locate its circumcentre.
1. Draw a $\triangle ABC$ with sides $AC = 5\text{cm}$, $AB = 5.5\text{cm}$, $\angle A = 75^\circ$. Find its incentre.

2. Draw a $\triangle PQR$ with $\angle Q = 115^\circ$, $PQ = 4.5\text{cm}$, $QR = 6.5\text{cm}$. Find its incentre. Where does it lie?

3. Draw an isosceles triangle $DEF$, $\angle E = 70^\circ$, $DE = EF = 6\text{cm}$. Draw its incentre. Which of the angle-bisectors will be equal?

4. Draw an equilateral triangle of side $6\text{cm}$. Draw circumcentre, centroid, orthocenter and incentre. Tell whether all lie on the same point.

5. Fill in the blanks:
   (i). Incentre of a triangle is the point of concurrence of the __________ of the triangle.
   (ii). __________ is the line segment which bisects an angle of the triangle and has its other end – point on the opposite side of that angle.
   (iii). If $G$ is incentre of $\triangle DEF$, then $DI$ bisects _______.
Q1. Draw a cuboid. Name its edges J,K,L,N,O,P and Q such that (i) JKLM forms the base. (ii) NOJ is the front face.
   Name (i). Face opposite to NOJK
   (ii). Face adjacent to KMOP
   (iii). Faces which meet in the edge JL
   (iv). Line segment representing height of the cuboid.
   (v). Three edges which meet in the vertex M
   (vi). Face representing top of the cuboid
   (vii). All diagonals of the cuboid
   (viii). All the opposite vertices

Q2. 

Arrange the above faces in such a way that the line segment marked with the same number are parallel to each other or coincident. What shape do you obtain? Name all the faces.
1. Find the surface area of the room with dimensions 15m, 10m and 20m.

2. Find the surface area of the soapcake box with length, breadth and height, 0.8m, 50cm and 1m respectively.

3. Find the surface area of the cubical shaped box of edge 0.9m.

4. A wooden box is in the form of cuboid whose length, breadth and height are 10m50cm, 80cm and 75.5cm, respectively. Find the cost of painting outside at the rate of Rs 2 per m².

5. The area of cardboard is 14400cm². How many cubical boxes of edge 100cm can be made from this sheet? Find the cost of cardboard for making these boxes at the rate of Rs 2 per m².
Q1. A room is 12m long, 10m2cm wide and 9m7cm high. Find the total area to be painted inside four walls and on the ceiling.

Q2. A basement in a shop is 20m in length, 17m in breadth and 8m in depth. Find the cost of cement its floor and walls at the rate of Rs 48 per m².

Q3. The floor of a rectangular hall has a perimeter 300m. If its height is 600cm, find the cost of painting its four walls at the rate of Rs 30 per m².

Q4. The paint is sufficient to paint 500m². How much boxes of dimensions 6m60cm, 50cm and 0.4 can be painted out of this container?

Q5. The perimeter of the cuboid is 250cm. If its height is 0.6m, find its lateral surface area.

Q6. The dimensions of a room are 7.5m * 5.2m * 4m. Find the cost of papering its walls by a 4cm wall paper at the rate of Rs 20 per meter by length.
1. Find the volume of cuboid whose length, breadth and height are:
   (i) 18.5m, 92cm, 20.4m
   (ii) 8m, 700cm, 6000mm

2. Find the volume of a cube whose edge is 2.85cm.

3. A cuboidal cardboard box has the capacity of 216cm³. If its length is 6cm and breadth is 4cm, find its height.

4. A soapcake measures 6cm * 4.5cm * 3.5cm. What will be the volume of cardboard box which contains 640 such soapcakes.

5. A cuboid water reservoir which is 20m75cm long, 14m25cm wide and 10m deep. How many litres of water can it hold?

6. A cuboidal pit 5m long and 4.5m wide is dug to a certain depth. If the earth taken out of it is 20m³, what is the depth of the pit?

7. Convert 25.5m³ in mm³.
Q1. The capacity of the cuboidal tank is 60000L of water. Find the depth of the tank if its length and breadth are 2.75m and 10.5m respectively?

Q2. How many wooden planks of size 2.5m*25cm*10cm can be prepared from a wooden block 2 long, 500cm wide and 2.5m thick? Assume that there is no wastage.

Q3. A brick is 24cm long, 14cm wide and 7cm thick. How many such bricks will be required to build 7m long, 3m high and 28cm thick?

Q4. A match box is 5.5cm long, 3cm broad and 1.2cm thick. What is the volume of the packet which contains such 10 match boxes?

Q5. A metal cuboid which is 0.9m long, 0.6m wide and 40cm thick, is melted and recast into a cube of the same volume.