BRAIN INTERNATIONAL SCHOOL

SESSION 2024-25

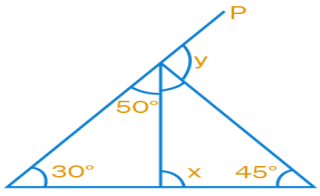
CLASS: VII **ANNUAL REVISION SHEET** **SUBJECT: MATHEMATICS**

SIMPLE EQUATIONS

1. Write the following statements in the form of equations.
   (a) The sum of four times a number and 5 gives a number five times of it.
   (b) One-fourth of a number is 2 more than 5.
2. Write the following equations in statement form:
   (a) $5x = 20$
   (b) $3y + 7 = 1$
3. If $k + 7 = 10$, find the value of $9k - 50$.
4. Solve the following equation:
   $3(y - 2) = 2(y - 1) - 3$
5. If 5 is added to twice a number, the result is 29. Find the number.
6. Each of the 2 equal sides of an isosceles triangle is twice as large as the third side. If the perimeter of the triangle is 30 cm, find the length of each side of the triangle.
7. Check whether the given value of variable is a solution to the equation or not:
   $\frac{y+2}{5} = \frac{y-4}{2}$ $(y = 8)$

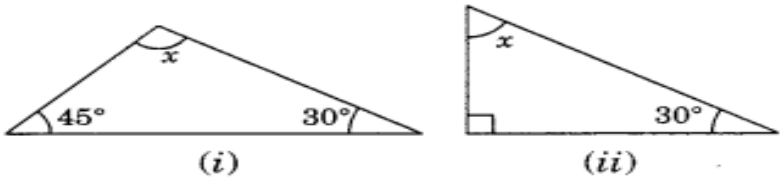
THE TRIANGLE AND ITS PROPERTIES

1. Is it possible to draw a triangle whose sides are 5cm, 7cm and 12cm? Give reason in support of your answer.
2. In the figure given alongside, find the values of x and y.



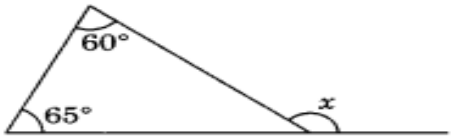
3. Two sides of a triangle are 3 cm and 5 cm. What can be the maximum length of the third side?
4. In Δ ABC, AD is the bisector of ∠A meeting BC at D, CF is perpendicular to AB and E is the mid-point of AC. Name the median of the triangle.

5. One of the exterior angles of a triangle is 120° and the interior opposite angles are in the ratio 1:2. Find the largest angle of the triangle.
6. In the given diagrams, find the value of x in each case.

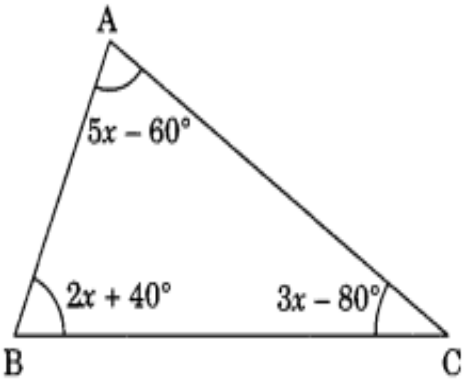


(i)

(ii)



(iii)



7. Find whether the following triplets are Pythagorean or not?
   a) (5, 8, 17)
   b) (8, 15, 17)
8. The length of the diagonals of a rhombus is 42 cm and 40 cm. Find the perimeter of the rhombus.

COMPARING QUANTITIES

1. Find:
   (i) 36% of 400
   (ii) $16\frac{2}{3}$ % of 32
2. Find the ratio of 90 cm to 1.5 m.
3. What per cent of 40 kg is 440 g?
4. Convert each of the following into the decimal form:
   (a) 25.2%
   (b) 0.15%
   (c) 25%
5. What per cent of 75 is 1225?
6. A machine costs ₹7500. Its value decreases by 5% every year due to usage. What will be its price after one year?
7. A machine is purchased for ₹1700 and sold for ₹1870. Find its profit percentage?
8. What sum of money lent out at 12 per cent p.a. simple interest would produce ₹ 9000 as interest in 2 years?
9. Rashmi obtains 480 marks out of 600. Rajan obtains 560 marks out of 700. Whose performance is better?

10. The cost of an object is increased by 12%. If the current cost is ₹ 896, what was its original cost?
11. Calculate the simple interest at the end of 2 years on Rs.4,000 at 5% interest per annum. Also find the amount paid.

RATIONAL NUMBERS

1. Reduce the following rational number in standard form.

$\frac{35}{-15}$

2. Represent $\frac{3}{2}$ and $\frac{-3}{4}$ on same number line.

3. Find: $\frac{-5}{6} \times \frac{18}{20}$

4. Subtract the sum of $\frac{-5}{6}$ and $-1\frac{3}{5}$ from the sum of $2\frac{2}{3}$ and $-6\frac{2}{5}$.

5. Find: $\frac{-5}{6} \div \frac{20}{18}$

6. Write the additive inverse of: $\frac{-7}{9} + \frac{5}{6}$

7. Write the multiplicative inverse of: $\frac{4}{5} \times \frac{15}{24}$

8. The product of two rational numbers is $\frac{-16}{9}$. If one of the numbers is $\left(\frac{-4}{3}\right)$, find the other.

9. The sum of two rational numbers is - 4. If one of the numbers is $\left(\frac{-9}{7}\right)$, find the other.

ALGEBRAIC EXPRESSIONS

1. Identify the terms in the given expressions and write their coefficients.

(i) $5x - 3$

(ii) $11 - 2y^2$

(iii) $2x - 1$

(iv) $4x^2y + 3xy^2 - 5$

2. Group the like terms together from the following expressions:

$-8x^2y$, $3x$, $4y$, $-32x$, $2x^2y$, $-y$

3. Classify the following into monomials, binomial and trinomials:

(i) -6

(ii) $-5 + x$

(iii) $6x^2 + 5x^2 - 3$

4. Draw the tree diagram for the given expressions:

(i) $-3xy + 10$

(ii) $x^2 + y^2$

5. Add:

   (i) $3x^2y$, $-5x^2y$, $-x^2y$

   (ii) $a + b - 3$, $b + 2a - 1$

6. Simplify by combining the like terms:

   (i) $a - (a - b) - b - (b - a)$

   (ii) $x^2 - 3x + y^2 - x - 2y^2$

7. Subtract $3x^2 - 5y - 2$ from $5y - 3x^2 + xy$ and find the value of the result if $x = 2$, $y = -1$.

8. Simplify the following expression and then find the numerical values for $x = -2$:

   $-2(-3x + 5) - 2(x + 4)$

EXPONENTS AND POWERS

1. Express the following number as a powers of prime factors:

   (i) 144

   (ii) 225

2. Express the following in exponential form:

   (i) $5 \times 5 \times 5 \times 5 \times 5$

   (ii) $a \times a \times a \times b \times c \times c \times c \times d \times d$

3. Express each of the following as product of powers of their prime factors:

   (i) 405

   (ii) 504

4. Write the following in expanded form:

   (i) 70,824

   (ii) 1,69,835

5. Find the number from each of the expanded form:

   (i) $7 \times 10^8 + 3 \times 10^5 + 7 \times 10^2 + 6 \times 10^1 + 9$

   (ii) $4 \times 10^7 + 6 \times 10^3 + 5$

6. Find the value of

   (i) $3° \div 4°$

   (ii) $(8° - 2°) \div (8° + 2°)$

   (iii) $(2° + 3° + 4°) - (4° - 3° - 2°)$

7. Express the following in standard form:

   (i) 8,19,00,000

   (ii) 5,94,00,00,00,000

   (iii) 6892.25

8. Simplify using laws of exponents:

(i) $\frac{3^5 \times 10^5 \times 25^2}{5^7 \times 6^4}$ (ii) $\frac{3^3 \times 2^{10} \times 8^0}{2^7 \times 6^3}$.

MCQ

1. If 'n' divided by 6 equals 4, then 'n' = _____.
   a) 14 b) 24 c) 10 d) 2
2. 20% of 155 is _____.
   a) 155 b) 31 c) 55 d) 20
3. The incorrect statement for the given expression: 3p – 2 = 7 is _____
   a) 3p is 7 more than 2.
   b) Difference of 3p and 2 is 7, if 3p > 2.
   c) 2 subtracted from 3p gives 7.
   d) 2 less than the product of 3 and p gives 7.
4. If 10 is 10% of a number, then the number is _____.
   a) 10 b) 100 c) 1000 d) 1
5. The value of $(–2)^4$ is _____.
   a) –16 b) 16 c) 8 d) –8
6. If x is a rational number and 'a' and 'b' are whole numbers then the value of $x^a \div x^b$ is _____
   a) x^{a+b} b) x^{ab} c) x^{a-b} d) $x^{a \div b}$
7. The coefficient of y in 5x – 3y + 8 is
   a) 5 b) 2 c) 3 d) – 3

ASSERTION AND REASONING

DIRECTION: In the following questions from 1 to 6, a statement of **Assertion(A)** is followed by a statement of **Reason(R)**. Choose the correct option.

(a) Both Assertion and Reason are correct and Reason is the correct explanation for Assertion.
(b) Both Assertion and Reason are correct and Reason is the not the correct explanation for Assertion.
(c) Assertion is true but the Reason is false.
(d) Assertion is false but the Reason is true.

1. **Assertion:** In a right-angled triangle, the longest side is hypotenuse**.**
   Reason : The side opposite to the largest angle will be the hypotenuse.
2. **Assertion:** y = 7 is the solution of the equation: y + 3 = 10.
   Reason : On subtracting 3 from both sides we get 7.
3. **Assertion:** $(-1)^{15} = (-1)$
   Reason : (-1) raised to any even power is (+1).

4. **Assertion:** The ratio 1:4 in percentage is represented as 25%.
   Reason : We multiply the ratio by 100 to find the percentage.
5. **Assertion:** An item marked at ₹840 is sold for ₹714. The loss% is 15%.
   Reason : Loss = Cost Price – Sale Price.
6. **Assertion:** A triangle can have two obtuse angles.
   Reason : Sum of the three angles of a triangle is always 180°.

CASE STUDY BASED QUESTIONS

Q1) A baker is baking cookies for a party. He planned to bake a total of 76 cookies for the party. The number of chocolate chip cookies baked is 3 times the oatmeal cookies.

Based on the above information, answer the following questions:

(a) If 'c' represents the number of oatmeal cookies, write an expression for the number of chocolate chip cookies.

(b) Set up an equation to find the number of each type of cookie.

(c) How many of each type of cookie should the baker make?

Q2) A process of growth of bacteria in which a bacterial population increases in number through constant cell division. This process is also known as **exponential or geometric growth.** A certain type of bacteria doubles in number every hour. If you start with 10 bacteria:

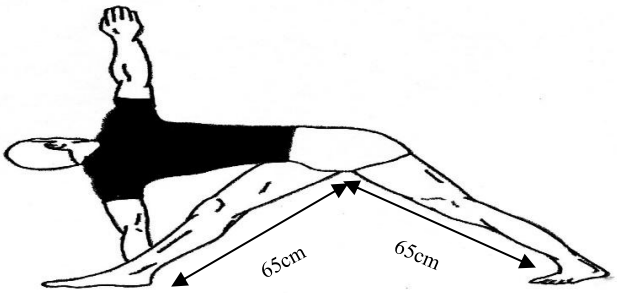
Based on the given information, answer the following questions:

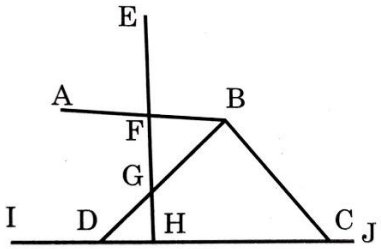
(a) How many bacteria will there be after 3 hours? Express the change in the number of bacteria using exponents.

(b) How many bacteria will there be after 5 hours? Express the change in the number of bacteria using exponents.

(c) If we start with 100 bacteria, how will the number of bacteria after 2 hours change compared to starting with 10?

Q3) An asana is a body posture and a general term for a sitting meditation pose. Later it is extended as exercise in hatha yoga and modern yoga. Different geometrical shapes can be observed in yoga poses. Utthita trikonasana in the given figure is reflecting perpendicular lines, intersecting lines, triangles etc. A line diagram is also been sketched to show this pose.





Based on the given information, answer the following questions:

a) In Δ BGF, if ∠BFG = 90° and ∠GBF = 40°, then find ∠BGH.

b) In Δ DGH, if HG = 15 cm and DH = 20cm, then find the length of GD.

c) In this pose of yoga, let the three angles of Δ BFG be in the ratio 1 : 2 : 3. Then find the measure of the greatest angle.