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Note:* F D P = Fraction, Decimal, Percentage *P A V = Perimeter, Area, Volume

Each test (Pre, Post, Delayed) has 4 tests on content areas (Fraction, Measurement, Equation, & Angle).

Each content area has 12 questions on each of the tests (Pre, Post, & Delayed).

The number within the dark rectangle represents the item number in each test-paper. For example cell 124 represents conceptual understanding question: First item from Perimeter, second item from area, and fourth item from volume.
Appendix E1: Question - Pre-Test

Fraction (Pretest)

Name:
School:
Class:
Roll No.:
Date:
Time: 45 min.

Attempt all questions

1. Shade 0.4 of the following figure.

2. Tick which of the four figures does not have a quarter?

3. Tick the figure that does not show 50% division.

4. Tick the correct distractor that represents the double-cross area given below.

5. Select the smallest fraction and explain why it is smallest.

6. Select the pair which is not an equivalent fraction? Answer why you consider them not equivalent.
7. Add.
\[ \frac{2}{5} + \frac{7}{15} \]
(a) 9/20  
(b) 9/15  
(c) 13/15

8. Multiply 7.4 x 1.2.
(a) 8.88  
(b) 8.18  
(c) 8.68

9. One fifth of the man's property goes to his son, two fifth of his property goes to his daughter. Find what portion of his property goes to his wife.

What is given in this problem? 
What is required?  
Draw a figure.  
What procedure do you use to find the answer? 
Give the answer.

10. Two parties contested in an election. One party got a half the votes. Another party got one third of the total votes. And rest of votes were invalid. Find the number of invalid votes.

What is given in this problem? 
What is required?  
Draw a figure.  
What procedure do you use to find the answer? 
Give the answer.

11. 156 km long road was repaired in 30 days. Find the length of the road that was repaired each day.

What is given in this problem? 
What is required?  
Draw a figure.  
What procedure do you use to find the answer? 
Give the answer.

12. If 17% of a certain number of oranges are rotten and the number of rotten oranges is 680. Make a diagram and calculate the total number of oranges.

What is given in this problem? 
What is required?  
Draw a figure.  
What procedure do you use to find the answer? 
Give the answer.
Measurement (Pretest)

Attempt all questions:

1. Colour the perimeter of the triangle.

2. Colour the area of the square.

3. Tick the box that shows the volume occupied.

4. Colour only two opposite faces of the cuboid.

5. If the rectangular field given below is 55 m long and 40 m wide then calculate the perimeter.

6. Estimate the area of the letter E given in 10-by-10 grid paper where one square represents one unit square.

7. Count the volume of the cuboid given below where each small box represents one cubic unit.

What is required? How do you get? Give the answer.
8. Count the number of cubic units given in the diagram below.

What is required?
How do you get?
Result

9. Make a rectangular garden which is 20 m wide. Its length is two times its width. Calculate the length of the boundary wall around it.

What is given in this problem?
What is required?
Draw a figure.
What procedure do you use to find the answer?
Give the answer.

10. A blackboard is 3.5 m long and 2.5 m wide. It is surrounded by 25 cm wide frame. What is the total area of the blackboard?

What is given in this problem?
What is required?
Draw a figure.
What procedure do you use to find the answer?
Give the answer.

11. Find the volume of a match box which is 5 cm long 4 cm wide and 2 cm high.

What is given in this problem?
What is required?
Draw a figure.
What procedure do you use to find the answer?
Give the answer.

12. A tank can hold 4 m$^3$ water and area of its floor is 4 m$^2$. Make a diagram of a tank and calculate what could be the depth of the tank.

What is given in this problem?
What is required?
Draw a figure.
What procedure do you use to find the answer?
Give the answer.
Equation (Pretest)

Attempt all questions.

1. Which one of the following is the meaning of □+4? Tick (√) the correct answer.
   (a) Summation of □ and 4
   (b) Difference between □ and 4
   (c) Product of □ and 4
   (d) Quotient of □ when divided by 4

2. Read the figure and tick the correct algebraic expression that represents the perimeter of the figure given below.
   (a) x + 3
   (b) 3x
   (c) x^2

3. Ram has some apples. He purchased two more apples. Tick the correct mathematical expression.
   (a) 2x
   (b) 2+x
   (c) x+x

4. To translate the balance model in mathematical sentence, read & tick the correct expression.
   (a) x+4+12 = 0
   (b) 3x+4+12 = 0
   (c) 3x+4 = 12

5. Which rectangle below has an area 6(x+1)? Tick and explain why it is an equivalent expression of 6(x+1)
   (a) x
   (b) 1
   (c) x

6. Which of the following axiom of equality is used in the reason given below? Tick & state the axiom.
   "If 2x = 8 then x = 4"
   (a) Addition axiom
   (b) Subtraction axiom
   (c) Multiplication axiom
   (d) Quotient axiom
7. Solve the equation presented in balance form below.
(a) Write the equation.
(b) What Procedure do you use.
(c) Give the answer.

8. What operation do you need first to solve $8x + 7 = 25$? Justify your answer.
(a) What is required?
(b) What Procedure do you use?
(c) Give the answer.

9. When a number is multiplied by 5, it increases by 40. Find the number.
(a) What is given?
(b) What is required?
(c) Write the mathematical expression.
(d) What procedure do you use?
(e) Give the answer.

10. A man is 45 years old and his son is 23 years old. In how many years' time will twice the man's age be equal to three times the son's age? Formulate the problem and solve it.
(a) What is given?
(b) What is required?
(c) Write the mathematical expression.
(d) What procedure do you use?
(e) Give the answer.

11. If the sum of the Rs. 5 and twice the Ram's money is 17, then find out the amount of money Ram has.

What is given in this problem?
What is required?
Draw a figure.
What procedure do you use to find the answer?
Give the answer.

12. Make an equation and calculate which three consecutive numbers have a sum of 54?

What is given in this problem?
What is required?
Draw a figure.
What procedure do you use to find the answer?
Give the answer.
Appendix El: Question - Pre-Tesi

Angle (Pretest)

Name: 
School: 
Class: 
Roll No.: 
Date: 
Time: 45 min.

Attempt all questions.
1. Colour the given angle.

2. Label the given angle as an acute, right or obtuse angle.

3. Read the measure of the angle shown in the protractor given below.

4. Write the measure of the angle present in the geometrical instrument given above?

5. Estimate the angle given below.
   What is required?
   How do you get?
   Give the answer.

6. Construct an angle of measure 135° with the help of protractor.
   What is required?
   How do you get?
   Result

7. Measure the angle of the quadrilateral given below and find the sum.
   What is required?
   How do you get?
   Give the answer.

8. Figure out the measure of the third angle of a triangle given below.
   What is required?
   How do you get?
   Result
9. What is the sum of the exterior angles of the Triangle given below? Solve it.
What is given in this problem?
What is required?
Draw a figure.
What procedure do you use to find the answer?
Give the answer.

10. Make the hands of the clock to show 4 o'clock and calculate the measure of the obtuse angle made by the hands of the clock.

What is given in this problem?
What is required?
Draw a figure.
What procedure do you use to find the answer?
Give the answer.

11. Find the sum of the angles in the pentagon given below?

What is given in this problem?
What is required?
Draw a figure.
What procedure do you use to find the answer?
Give the answer.

12. Recognize the geometrical instrument given below. What do we use these instruments in geometry lessons?
Appendix E2: Question - Post-Test
Fraction (Posttest)

Name: Class: Roll No.: School: Date: Time: 45 min.

Attempt all questions

1. Shade 50% of the given figure.

2. Tick the figure which does not have a quarter?
   (a)  
   (b)  
   (c)  
   (d)  

3. Tick the figure that does not show 25%.

4. Tick the correct distractor that represents of the double-cross area given below.
   (a) $\frac{2}{3} + \frac{1}{2}$
   (b) $\frac{2}{3} \times \frac{1}{2}$
   (c) $\frac{2}{3} \cdot \frac{1}{2}$

5. Select the greatest decimal number and explain why it is the greatest.
   (a) 0.28
   (b) 0.3
   (c) 0.099

6. Which one of the following is not equivalent to 0.3? Explain why you consider it not equivalent.
   (a) $\frac{3}{10}$
   (b) $\frac{3}{100}$
   (c) $30^\circ$

7. $32.4 - 15$ is equal to:
   (a) 30.9
   (b) 17.4
   (c) 17.9
8. Multiply
\[ \frac{2}{5} \times \frac{15}{21} \]
(a) \( \frac{2}{7} \)
(b) \( \frac{30}{21} \)
(c) \( \frac{3}{5} \)

9. If the one third of the biscuit packet weighs 100 g. Make a diagram and calculate the total weight of the whole packet of biscuit.
   
   What is given in this problem?
   What is required?
   Draw a figure.
   What procedure do you use to find the answer?
   Give the answer.

10. Ram and Shyam took \( \frac{1}{2} \) and \( \frac{3}{10} \) parts of the money from a bank. Rest of the money was given to Mahesh. Make a diagram and calculate what part of money did Mahesh get?
   
   What is given in this problem?
   What is required?
   Draw a figure.
   What procedure do you use to find the answer?
   Give the answer.

11. If Rs. 636.60 is collected as fee from six students, find the amount of the money each student paid.
   
   What is given in this problem?
   What is required?
   Draw a figure.
   What procedure do you use to find the answer?
   Give the answer.

12. In the math examination 12 questions are asked, if 25% of them are from Geometry, then draw a diagram and find the number of questions from Geometry.
   
   What is given in this problem?
   What is required?
   Draw a figure.
   What procedure do you use to find the answer?
   Give the answer.
Measurement (Posttest)

Name: 
School: 
Class: 
Roll No.: 
Date: 
Time: 45 min.

Attempt all questions

1. Colour the perimeter of the rectangle.

2. Colour the area of the triangle.

3. Tick the box that shows the volume occupied.
   (a) 
   (b) 
   (c) 

4. Colour the edges of the cuboid.

5. A square given below has been divided into two equal parts. Calculate the length of the distance all around four sides of the shadowed part.

   What is required ?
   How do you get ?
   Give your answer.

6. Estimate the number of the unit used in letter H given in 4-by-4 geo-dot paper where four dots represent a square unit.

   What is required ?
   How do you get ?
   Give your answer.

7. Calculate the volume of the cuboid given below where each small box represents one cubic unit.

   What is required ?
   How do you get ?
   Give your answer.
8. Count the number of cubic units given in the diagram below.

What is required?
How do you get?
Result

9. Make a square field which is 25 m long. Find the length of the fence needed to fence around it five times.

What is given in this problem?
What is required?
Draw a figure.
What procedure do you use to find the answer?
Give the answer.

10. A square shaped cotton handkerchief which has length of 45 cm and is surrounded by 25 mm border. What is the area of the border?

What is given in this problem?
What is required?
Draw a figure.
What procedure do you use to find the answer?
Give the answer.

11. Find the volume of a box with dimensions 17 cm, 20 cm and 5 cm.

What is given in this problem?
What is required?
Draw a figure.
What procedure do you use to find the answer?
Give the answer.

12. Make a diagram of cubic centimeter and calculate the number of cubic centimeter in the cubic meter.

What is given in this problem?
What is required?
Draw a figure.
What procedure do you use to find the answer?
Give the answer.
Equation (Posttest)

Name: Class: Roll No.: School: Date: Time: 45 min.

Attempt all questions.

1. Which one of the following is the meaning of □-4? Tick (✓) the correct answer.
   (a) □ and 4 are added
   (b) □ is subtracted from 4
   (c) □ is multiplied by 4
   (d) □ is divided by 4

2. What could be the corresponding length of the line segment AB tabulated below? Read the figure and tick the correct answer.
   (a) 3x cm
   (b) 3+x cm
   (c) (3+x) cm

3. Out of 500 students some are absent. Express the number of students present if the number of absent is x.
   (a) x+500
   (b) 500x
   (c) 500-x

4. To translate the balance model in mathematical sentence & tick the correct expression.
   (a) x+4+12 = 0
   (b) 2x+4+12 = 0
   (c) 2x+4 = 12

5. Which rectangle below has an area 5(2x)? Tick and explain why it is an equivalent expression of 5(2x).
   (a) x 5
   (b) 2 5
   (c) 2x

6. Which of the following axiom of equality is used in the reason given below? Tick & state the axiom.
   “If 1/2x = 8 then x = 16”
   (a) Addition axiom
   (b) Subtraction axiom
   (c) Multiplication axiom
   (d) Quotient axiom
7. Solve the equation presented in balance form below.

(a) Write the corresponding equation
(b) Procedure
(c) Result

\[ 8x + 7 = 25 \]

8. What's the difference between \( \frac{x + 2}{4} = 5 \) and \( \frac{x}{4} + 2 = 5 \) ? Justify your answer.

9. If a boy thinks a number, doubles it and adds 7 to it. If the result is 41, find the number which he thought of.
   (a) What is given?
   (b) What is required?
   (c) Write the mathematical expression
   (d) What procedure do you use?
   (e) Give the answer.

10. Sita is four years older than Gita. The total of their ages is 10. Formulate the problem and solve how old are they now?
    (a) What is given?
    (b) What is required?
    (c) Write the mathematical expression
    (d) What procedure do you use?
    (e) Give the answer.

11. If \( x, x + 1 \) and \( x + 2 \) are the measure in centimeter of the sides of a triangle and the perimeter is 24 cm, then find out the measurement of the corresponding sides of the triangle.
    (a) What is given?
    (b) What is required?
    (c) Write the mathematical expression
    (d) Procedure
    (e) Give the answer.

12. Which two consecutive numbers have a sum of 43? Find what are the numbers.
    (a) What is given?
    (b) What is required?
    (c) Write the mathematical expression
    (d) Procedure
    (e) Result
Angle (Posttest)

Name: 
Class: 
School: 
Date: 
Roll No.: 
Time: 45 min.

Attempt all question.

1. Colour the given angle.

2. Label the given angle as an acute, right or obtuse angle.

3. Read the measure of the angle shown in the protractor given below.

4. Write the measure of the angle present in your geometrical instrument given above.

5. Estimate the angle given below.
   
   What is required ?
   How do you get ?
   Result

6. Construct an angle of measure $145^\circ$ with the help of protractor.
   What is required ?
   How do you get ?
   Result

7. Measure the angles of the quadrilateral given below and find their sum.
   What is required ?
   How do you get ?
   Result

8. Figure out the measure of the fourth angle of a quadrilateral given below?
   What is required ?
   How do you get ?
   Give the answer.
9. What is the sum of the exterior angles of the quadrilateral given below? Solve it.

What is given in this problem?
What is required?
Draw a figure.
What procedure do you use to find the answer?
Give the answer.

10. Make the hands of the clock to show 5 o'clock and calculate the measure of the obtuse angle made by the hands of the clock.

What is given in this problem?
What is required?
Draw a figure.
What procedure do you use to find the answer?
Give the answer.

11. Find the sum of the angles in the hexagon given below?

What is given in this problem?
What is required?
Draw a figure.
What procedure do you use to find the answer?
Give the answer.

12. Write the name of the geometrical instruments given below and state why we use these instruments used for in geometry lessons?
Appendix E3: Question - Delayed Post-Test

Fraction (Delayed-Posttests)

Name: Class: Roll No.: School: Date: Time: 45 min.

Attempt all questions

1. Shade 0.4 of the following figure.

2. Tick which one of the following is not an example of fourths?

3. Tick the figure that does not show 20%.

4. Tick the correct distractor that represents of the double-cross area given below.
   (a) 2/3 + 3/4
   (b) 2/3 - 3/4
   (c) 2/3 x 3/4

5. Select the smallest decimal number and explain why it is the smallest one.
   (a) 0.028
   (b) 0.1
   (c) 0.205

6. Which one of the following is the equivalent expression for 1 1/2? Explain why you consider it equivalent.
   (a) 120%
   (b) 1.15
   (c) 11/5

7. Add.
   2/7 + 3/14
   (a) 5/21
   (b) 11/14
8. Multiply.
\[ \frac{2}{3} \times \frac{5}{8} = ? \]
(a) \( \frac{5}{12} \)
(b) \( \frac{1}{4} \)
(c) \( \frac{7}{12} \)

9. A picture hall has \( \frac{3}{7} \) of the seats of Class I, \( \frac{5}{14} \) of the total seats of Class II, and rest of the seats are of Class III. Find the total number of seats of Class III?

What is given in this problem?
What is required?
Draw a figure.
What procedure do you use to find the answer?
Give the answer.

10. Ramesh, Mahesh and Naresh organized a party. Naresh pays 50\% of the bill and rest is shared equally by the others. Draw a dragram and find the percentage of the bill which Ramesh pays and solve it.

What is given in this problem?
What is required?
Draw a figure.
What procedure do you use to find the answer?
Give the answer.

11. 25 gm of wheat contains 25.75 units of Vitamin A. Find the number of units of vitamin contain in 1 gm.

What is given in this problem?
What is required?
Draw a figure.
What procedure do you use to find the answer?
Give the answer.

12. A shopkeeper’s cost price for a toy is Rs. 500 and made a profit of 20\%. Find the selling price of the toy.

What is given in this problem?
What is required?
Draw a figure.
What procedure do you use to find the answer?
Give the answer.
Measurement (Delayed-Posttest)

Name:  
School: 
Class:  
Roll No.: 
Date:  
Time: 45 min.

Attempt all questions

1. Colour the perimeter of the square.

2. Colour the area of the rectangle.

3. Tick the box that shows the volume occupied.
   (a)     (b)     (c)

4. Given a cuboid shade the vertices of the cuboid by dark dots.

5. Calculate & fill out the blanks by suitable unit of measurement in the rectangle.

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<td>14 cm</td>
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</table>

6. Estimate the area of the letter L given in 4-by-4 geo-board where four nails represent the square unit.
   What is required?
   How do you get?
   Give the answer.

7. Calculate the volume of the cuboid given below where each small box represents one cubic unit.
   What is required?
   How do you get?
   Result
8. Count the number of cubic unit given in the diagram below.

What is required?
How do you get?
Result

9. Make a rectangular field which is 10 m long and whose width is 2/5 of the long side. Calculate the perimeter of the field?

What is given?
Draw a figure
What is required?
What procedure do you use?
Result

10. The area of a square with one side 8 cm long is equal to the area of rectangle whose length is 16 cm. Draw the rectangle and find what could be the breadth of the rectangle?

What is given?
Draw a figure
What is required?
What procedure do you use?
Result

11. Find the volume of a bulb box which is 7 cm long, 5 cm wide and 4 cm high.

What is given?
Draw a figure
What is required?
What procedure do you use?
Result

12. The area of the bottom of a water tank is 4 meter square and it is 1 meter deep. Draw the figure of a tank and find the number litres of water will it hold? (Given 1 m$^3$ = 1,000 Ltrs)

What is given?
Draw a figure
What is required?
What procedure do you use?
Result
1. Which one of the following is the meaning of $4a$? Tick the correct answer.
   (a) $4$ and $a$ are added
   (b) $a$ is subtracted from $4$
   (c) $4$ is multiplied by $a$
   (d) $4$ is divided by $a$

2. What could be the algebraic expression for the perimeter of the figure given below? Read the figure and tick the correct answer.
   (a) $4y$
   (b) $y'$
   (c) $y$ $y$ $y$ $y$

3. Sushil had Rs. $Y$ with him. He spent Rs. $2$. Express the sum of the money he left with.
   (a) $y+2$
   (b) $y-2$
   (c) $2y$

4. Tick the correct expression to translate the balance model in mathematical sentence and explain why it is so.
   (a) $x + 4 + 12 = 0$
   (b) $2x + 4 + 12 = 0$
   (c) $2x + 4 = 12$

5. Which rectangle below has an area $2(5x)$? Tick and explain why it is an equivalent expression of $2(5x)$.
   (a)  
   (b)  
   (c)  

6. Which of the following axiom of equality is used in the reason given below? Tick & state the axiom.
   "If $x + 5 = 16$ then $x = 11$"
   (a) Addition axiom
   (b) Subtraction axiom
   (c) Multiplication axiom
7. Solve the equation presented in balance form below.
   (a) Write the equation \( \frac{2(x-3)+12}{6(x-5)} \)
   (b) Procedure
   (c) Result

8. To solve \( \frac{2}{3}x = 8 \), what operation will you apply? Justify your answer.
   (a) What is required?
   (b) Procedure
   (c) Result

9. If a number and its half together is equal to 30, then find is the number.
   (a) What are given?
   (b) What is required?
   (c) Write the mathematical expression
   (d) Procedure
   (e) Result

10. A girl is twice as old as her brother. Three years ago their ages were 18. Solve the equation and find how old are they now?
    (a) What are given?
    (b) What is required?
    (c) Write the mathematical expression
    (d) Procedure
    (e) Result

11. Number of boys in any school is twice the number of girls. If there are 300 students in the school, then find out the number of the girls.
    (a) What are given?
    (b) What is required?
    (c) Write the mathematical expression
    (d) Procedure
    (e) Result

12. Make and calculate what are three consecutive integers whose sum is 117?
    (a) What are given?
    (b) What is required?
    (c) Write the mathematical expression
    (d) Procedure
    (e) Result
Appendix E3: Question - Delayed Post-Test

Angle (Delayed - Posttest)

Name: 
School: 
Class: 
Date: 
Roll No.: 
Time: 45 min.

Attempt all questions.

1. Colour the given angle.

2. Label the given angle as an acute, right or obtuse angle.

3. Read the measure of the angle shown in the protractor given below.

4. Write the measure of the angle present in your geometrical instrument given above.

5. Estimate the angle given below.
   What is required?
   How do you get?
   Result

6. Construct an angle of measure 110° with the help of protractor.

7. Measure the angle of the quadrilateral given below and find their sum.

8. Figure out what could be the measure of the angle of a triangle given below?
9. What is the sum of the exterior angles of the triangle given below? Solve it.
   What is given?
   Draw a figure
   What is required?
   What procedure do you use?
   Result

10. Make the hands of the clock to show 8 o’clock and calculate the measure of the obtuse angle made by
    the hands of the clock.
    What is given?
    Draw a figure
    What is required?
    What procedure do you use?
    Result

11. Find the sum of the angle of the hexagon given below.
    What is given?
    Draw a figure
    What is required?
    What procedure do you use?
    Result

12. Write the name of the geometrical instrument given below and state why we use these instruments in
    geometry lessons.
    What is given?
    Draw a figure
    What is required?
    What procedure do you use?
    Result