# CBSE Board Class VII Mathematics Term II Sample Paper 2 – Solution

Time: 2 <sup>1</sup>/<sub>2</sub> hours

Total Marks: 80

# Section A

**1.** Correct answer: B

$$56\% = \frac{56}{100} = 0.56$$

- Correct answer: B
   For the option (B), 1 is the only common factor between numerator and
   denominator and the denominator is a positive integer, hence it is in the standard
   form.
- Correct answer: D
   6 components three angles and three sides
- **4.** Correct answer: A Cylinder



5. Correct answer: B
-x + 1 is an example of binomial as it contains two terms.

6. Correct answer: C  

$$\frac{16}{25} = \frac{2 \times 2 \times 2 \times 2}{5 \times 5} = \frac{2^4}{5^2}$$

7. Correct answer: A



Hence, order of rotational symmetry is 2.

- **8.** Correct answer: C The length of given cuboid is 6 units.
- 9. Correct answer: D  $\frac{11^{10}}{11^6} = 11^{10-6} = 11^4$
- **10.** Correct answer: A Perimeter of rhombus = 28 cm Thus, 4 x (side) = 28 cm Side =  $\frac{28}{4}$  = 7 cm
- **11.** Correct answer: A (128 ÷ 32) ÷ (-4) = 4 ÷ (-4) = -1
- **12.** Correct answer: A

2x + 3 = 7

If we transpose 3 to RHS, then the term with variable will remain on one side and the constants will be on the other side. So, the first step is to transpose 3 to RHS.

i.e. 2x = 7 - 3

# **Section B**

**13.** Percentage of marks scored by Rahul =  $\frac{40}{50} \times 100 = 80\%$ Percentage of marks scored by Rohan =  $\frac{75}{100} \times 100 = 75\%$ Hence, Rahul scored more marks than Rohan. **14.** In the given number line, the rational number between 0 and -1 would be  $\frac{-1}{2}$ . Rational number between 1 and 2 is  $\frac{3}{2}$  as 1 can be written as  $\frac{2}{2}$ . So, the next point would be  $\frac{3}{2}$  and 2 can be written as  $\frac{4}{2}$ , which is the same. Thus, the number line representing the missing values is as follows:



#### 15.

- (a)  $\angle A = 120^{\circ}$ ,  $\angle B = 90^{\circ}$  and AB = 8 cmSince,  $\angle A + \angle B = 120^{\circ} + 90^{\circ} = 210^{\circ}$ That is the sum of two angles is more than 180°. Hence, the triangle is not possible.
- (b)  $\angle P = 90^{\circ}$ ,  $\angle Q = 90^{\circ}$  and PQ = 9 cm Since,  $\angle P + \angle Q = 90^{\circ} + 90^{\circ} = 180^{\circ}$ That is the sum of two angles is equal to 180°. And the measure of third angle is zero. Hence, the triangle is not possible.

#### 16.

Area of a parallelogram is given by

= base (b) x height (h)  
= 
$$(3\frac{1}{2} \text{ cm}) \times (1\frac{2}{7} \text{ cm})$$
  
=  $\frac{7}{2} \times \frac{9}{7} \text{ cm}^2$   
=  $\frac{9}{2} \text{ cm}^2$   
= 4.5 cm<sup>2</sup>

Thus, the area of the parallelogram is 4.5 sq. cm.

#### **17.** Required sum:

 $\begin{array}{l} (6m - 7n - 5p) + (-4m - 9n + 6p) + (-4m - 9n + 6p) \\ = 6m - 7n - 5p - 4m - 9n + 6p - 4m - 9n + 6p \\ = (6m - 4m - 4m) + (-7n - 9n - 9n) + (-5p + 6p + 6p) \\ = (6 - 4 - 4)m + (-7 - 9 - 9)n + (-5 + 6 + 6)p \\ = -2m - 25n + 7p \end{array}$ 

**18**.

(i) 
$$\left(\frac{-7}{9}\right)^3 = \frac{-7}{9} \times \frac{-7}{9} \times \frac{-7}{9} = \frac{-7 \times -7 \times -7}{9 \times 9 \times 9}$$
  
(ii)  $\left(\frac{5}{8}\right)^6 = \frac{5}{8} \times \frac{5}{8} \times \frac{5}{8} \times \frac{5}{8} \times \frac{5}{8} \times \frac{5}{8} = \frac{5 \times 5 \times 5 \times 5 \times 5 \times 5}{8 \times 8 \times 8 \times 8 \times 8}$ 

**19.** The other holes are as below:



0 0

010

ii.

i.

# 1. 1. First take an isometric dot sheet.

- 2. Draw the line segment AB and AD of length 5 units and 3 units respectively.
- 3. For the height draw the line segment AG, BC and DE of 6 units each.
- 4. Join EG and GC.
- 5. Again draw EF and CF of 5 units and 3 units respectively.



- 21. Mass of earth = 5,970,000,000,000,000,000,000 kg = 597 × 10000000000000000000 kg = 597 × 10<sup>22</sup> kg = 5.97 × 10<sup>24</sup> kg
- **22.** Number of cubes in first layer = 7 Number of cubes in second layer = 2 Hence, total number of cubes = 7 + 2 = 9

# **23.** Average score = mean score

 $Mean = \frac{Sum of all observations}{Total number of observations}$  $= \frac{12 + 23 + 10 + 77 + 15 + 78 + 90 + 54 + 23 + 10 + 1}{11}$  $= \frac{393}{11}$ = 35.7

### 20.

# Section C

**25.** Let the unknown number be n.

$$\frac{1}{2} \text{ of } \frac{-3}{4} \text{ of } n = 6$$
  
i.e. 
$$\frac{1}{2} \times \frac{-3}{4} \times n = 6$$
$$\frac{-3}{8} \times n = 6$$
$$n = 6 \times \frac{8}{-3}$$
$$n = \frac{6 \times 8}{-3}$$
$$n = \frac{48}{-3}$$
$$n = -16$$

Thus, the required number is -16.

### 26.

$$CP = \left(\frac{100}{100 + \text{gain}\%}\right) \times SP$$
  
Thus, CP of 1<sup>St</sup> transistor  
$$= \left(\frac{100}{120} \times \text{Rs 840}\right) = \text{Rs 700}$$
  
CP of 2<sup>nd</sup> transistor  
$$= \left(\frac{100}{96} \times \text{Rs 960}\right) = \text{Rs 1000}$$
  
So, total C.P. = Rs. (700 + 1000) = Rs. 1700.  
Total S.P. = Rs. (840 + 960) = Rs. 1800.  
Gain = Rs (1800 - 1700) = Rs 100  
 $\therefore$  Gain% =  $\left(\frac{100}{1700} \times 100\right)\% = 5\frac{15}{17}\%$ 

## **27.** Steps of construction:

- 1. Draw a line BX and BY such that BY is perpendicular on BX.
- 2. Taking radius 3 cm and centre B cut the line BX at A.
- **3.** Taking radius 5 cm and centre A cut the line BY at C.
- **4.** Join AC.
- **5.** ABC is the required triangle.
- 6. Measure of side BC i.e. third side is 4 cm.



**28.** ASA congruence criterion:

The Angle Side Angle (ASA) postulate states that if under correspondence, two angles and the included side of a triangle is equal to two corresponding angles and included side of another triangle, then the two triangles are congruent. Consider the triangles ABC and XYZ as shown below.



Two angles and the included side are congruent.  $\angle ABC = \angle XYZ$  (equal angle) BC = YZ (equal side)  $\angle ACB = \angle XZY$  (equal angle) So,  $\triangle ABC \cong \triangle XYZ$ 

Therefore, by the ASA congruence criterion, the triangles are congruent.

- 29. The area of the shaded region can be obtained by removing the area of the small square from the area of the big square.
  Area of big square = 7 x 7 = 49 cm<sup>2</sup>
  Area of small square = 3 x 3 = 9 cm<sup>2</sup>
  Thus, area of the shaded region = 49 9 = 40 cm<sup>2</sup>
- **30.** Principal, P = Rs. 12500 Amount, A = Rs. 15500 Thus, S.I. = Rs. (A - P) = Rs. (15500 - 12500) = Rs. 3000. Rate =  $\left(\frac{100 \times \text{Simple Interest}}{\text{Principal x Time}}\right)\%$ Rate =  $\left(\frac{100 \times 3000}{12500 \times 4}\right)\%$ Rate = 6%
- **31.** Given, radius of the outer circle = 12 cm So, area of the outer circle =  $\pi r^2$  = 3.14 × 12<sup>2</sup> = 452.16 cm<sup>2</sup> Radius of the inner circle = 7 cm

Area of the inner circle =  $\pi r^2 = \frac{22}{7} \times 7^2 = 154 \text{ cm}^2$ 

Thus, the required area of the shaded portion

- = Area of the outer circle Area of the inner circle
- = 452.16 154
- $= 298.16 \text{ cm}^2$
- **32.** Coefficient of x is:
  - (i) 2 z
  - (ii) z<sup>3</sup>
  - (iii) 2

# **Section D**

- **33.** Steps of construction:
  - 1. Draw a line segment PQ = 5.7 cm.
  - 2. Draw an angle of 45° at P and 30° at Q and let them intersect at R.
  - 3. Thus, PQR is the required triangle.



- **34.** Multiply (3a + 3b) by (2a 2b). Verify the result for a = 2 and b = (-2)(3a + 3b) by  $(2a - 2b) = 3a(2a - 2b) + 3b(2a - 2b) = 6a^2 - 6ab + 6ab - 6b^2 = 6(a^2 - b^2)$ For a = 2, b = -2[(3a + 3b)(2a - 2b)] = [(0)(8)] = 0 $\Rightarrow 6(a^2 - b^2) = 6(4 - 4) = 0$
- **35.** Given, Perimeter of square = Perimeter of rectangle. Length (l) of the rectangle = 10 m Breadth (b) of the rectangle = 8 m Perimeter of the rectangle =  $2 \times (1 + b) = 2 \times (10 + 8) = 2 \times 18 = 36$  m So, perimeter of the square = 36 m Formula for perimeter of square: Perimeter of square =  $4 \times s$  $36 = 4 \times s$  [swap both sides]  $4 \times s = 36$  $s = \frac{36}{4} = 9$  m

Thus, the side of the square is 9 m.

36. Consider:

 $20x - [15x^{3}+5x^{2} - \{8x^{2} - (4 - 2x - x^{3}) - 5x^{3}\} - 2x]$   $= 20x - [15x^{3}+5x^{2} - \{8x^{2} - 4 + 2x + x^{3} - 5x^{3}\} - 2x]$   $= 20x - [15x^{3}+5x^{2} - \{8x^{2} - 4 + 2x - 4x^{3}\} - 2x]$   $= 20x - [15x^{3}+5x^{2} - 8x^{2} + 4 - 2x + 4x^{3} - 2x]$   $= 20x - [19x^{3} - 3x^{2} - 4x + 4]$   $= 20x - 19x^{3} + 3x^{2} + 4x - 4$   $= -19x^{3} + 3x^{2} + 24x - 4$ 

**37.** Total number of balls = 12

It is also given that the bag contains an equal number of balls of each of the four colours: yellow, blue, green and red.

Therefore,

Number of yellow balls = Number of blue balls = Number of green balls = Number of red balls = 3

$$P(yellow) = \frac{Number of yellow balls}{Total number of balls} = \frac{3}{12} = \frac{1}{4}$$

$$P(blue) = \frac{Number of blue balls}{Total number of balls} = \frac{3}{12} = \frac{1}{4}$$

$$P(green) = \frac{Number of green balls}{Total number of balls} = \frac{3}{12} = \frac{1}{4}$$

$$P(red) = \frac{Number of red balls}{Total number of balls} = \frac{3}{12} = \frac{1}{4}$$