

# GRADE VIII MODEL PAPER 2017

## MATHEMATICS

### CRQ Paper Marking Scheme

**Q1:**

6 Marks

If

$$A = \{2, 4, 6, 8\}$$

$$B = \{3, 5, 7, 9\}$$

$$C = \{1, 2, 3, 4, 5\}$$

then prove that

$$A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$$

#### **Possible Answer:**

Solution:

$$\text{Step 1: } B \cup C = \{3, 5, 7, 9\} \cup \{1, 2, 3, 4, 5\}$$

$$= \{1, 2, 3, 4, 5, 7, 9\}$$

$$\text{Step 2: } A \cap (B \cup C) = \{2, 4, 6, 8\} \cap \{1, 2, 3, 4, 5, 7, 9\}$$

$$= \{2, 4\} \rightarrow (A)$$

Now

$$\text{Step 3: } A \cap B = \{2, 4, 6, 8\} \cap \{3, 5, 7, 9\} = \{ \}$$

$$\text{Step 4: } A \cap C = \{2, 4, 6, 8\} \cap \{1, 2, 3, 4, 5\} = \{2, 4\}$$

$$\text{Step 5: } (A \cap B) \cup (A \cap C) = \{ \} \cup \{2, 4\}$$

$$= \{2, 4\} \rightarrow (B)$$

$$\text{Step 6: From A \& B } A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$$

$$\text{L.H.S} = \text{R.H.S}$$

#### **Checking Hints:**

Total 6 Marks

1 mark for each correct step (6 required)

**Q2:**

6 Marks

$$\text{If } U = \{x \mid x \in w \text{ and } 0 \leq x \leq 7\}$$

$$A = \{x \mid x \in z \text{ and } 2 \leq x \leq 5\}$$

$$B = \{x \mid x \in z \text{ and } 4 \leq x \leq 7\}$$

then prove that  $(A \cap B)' = A' \cup B'$

**Possible Answer:**

Solution:

Step 1:  $U = \{0,1,2,3,4,5,6,7\}$

$$A = \{2,4,5\} \quad B = \{4,5,6,7\}$$

Step 2:  $A \cap B = \{2,4,5\} \cap \{4,5,6,7\}$

$$= \{4,5\}$$

Step 3:  $(A \cap B)' = U - (A \cap B) = \{0,1,2,3,4,5,6,7\} - \{4,5\}$

$$\{0,1,2,3,6,7\} \rightarrow (1)$$

Step 4:  $A' = U - A = \{0,1,2,3,4,5,6,7\} - \{2,4,5\}$

$$= \{0,1,3,6,7\}$$

Step 5:  $B' = U - B = \{0,1,2,3,4,5,6,7\} - \{4,5,6,7\}$

$$= \{0,1,2,3\}$$

Step 6:  $A' \cup B'$

$$= \{0,1,3,6,7\} \cup \{0,1,2,3\}$$

$$= \{0,1,2,3,6,7\} \rightarrow (2)$$

From (1) and (2)

$$(A \cap B)' = A' \cup B'$$

**Checking Hints:**

Total 6 Marks

1 mark for each correct step (6 required)

**Q3:****6 Marks**

Find the values of

i.  $\sqrt[3]{216}$

ii.  $\left(\frac{1}{5}\right)^3$

**Possible Answer:**

Steps:

i.  $\sqrt[3]{216}$

Step 1:  $\sqrt[3]{216} = \sqrt[3]{6 \times 6 \times 6}$

Step 2:  $\sqrt[3]{(6)^3}$

Step 3: 6 Ans

ii.  $\left(\frac{1}{5}\right)^3$

Step 1:  $\left(\frac{1}{5}\right)^3 = \frac{1}{5} \times \frac{1}{5} \times \frac{1}{5}$

Step 2:  $= \frac{1}{25} \times \frac{1}{5}$

Step 3:  $\frac{1}{125}$  Ans

**Checking Hints:**

Total 6 Marks

1 mark for each correct step in part i (3 required)

1 mark for each correct step in part ii (3 required)

**Q4:**

6 Marks

Ali's monthly salary is Rs. 8000. Calculate his income tax at the rate of 5% and the rebate is Rs. 80,000.

**Possible Answer:**

Solution: Monthly income  
Rs. 8000  
Income for one year  
Step 1:  $8000 \times 12$   
Step 2: 96,000  
Rebate income: Rs. 80,000  
Step 3: Taxable income =  $96000 - 80,00$   
Step 4:  $= 16000$   
Step 5: Income tax at 5% =  $\frac{5}{100} \times 160,00$   
 $= 5 \times 160$   
Step 6:  $= Rs. 800$

**Checking Hints:**

Total 6 Marks

1 mark for each correct step (6 required)

**Q5:**

6 Marks

Find the value of  $x^2 + \frac{1}{x^2}$  when  $x + \frac{1}{x} = -12$

**Possible Answer:**

$$\text{As } x + \frac{1}{x} = -12$$

Step 1: Squaring both sides

$$\text{Step 2: } \left(x + \frac{1}{x}\right)^2 = (-12)^2$$

$$\text{Step 3: } x^2 + \frac{1}{x^2} + 2\left(\cancel{x}\right)\left(\frac{1}{\cancel{x}}\right) = 144$$

$$\text{Step 4: } x^2 + \frac{1}{x^2} + 2 = 144$$

$$\text{Step 5: } x^2 + \frac{1}{x^2} = 144 - 2$$

$$\text{Step 6: } x^2 + \frac{1}{x^2} = 142 \text{ Ans}$$

**Checking Hints:**

Total 6 Marks

1 mark for each correct step (6 required)

**Q6:**

6 Marks

Ali and Kamal together get pocket money of Rs.150 daily. If Ali gets Rs. 50 more than Kamal then how much pocket money Ali and Kamal gets daily.

Let  $x$  be the pocket money of Ali and  $y$  be the pocket money of Kamal then we have

Step 1

$$x + y = 150 \dots\dots\dots 1$$

$$x + y = 50 \dots\dots\dots 2$$

Step 2

$$x + y = 150$$

$$x + y = 50$$

$$\hline 2x = 200$$

Step 3

$$x = \frac{200}{2}$$

$$x = 100$$

Step 4 Putting the value of  $x$  in equation 1

$$x + y = 150$$

$$100 + y = 150$$

Step 5

$$y = 150 - 100$$

$$y = 50$$

Step 6

So Ali's pocket money is Rs. 100

Kamal's pocket money is Rs. 50

**Checking Hints:**

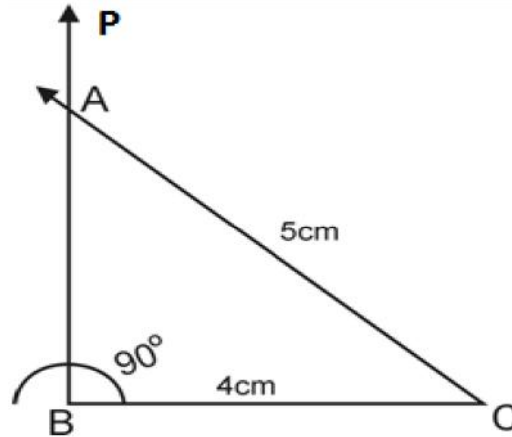
Total 6 Marks

1 mark for each correct step (6 required)

**Q7:**

6 Marks

Construct a right angled triangle ABC, where  $\angle B = 90^\circ$ ,  $\overline{BC} = 4\text{cm}$  and hypotenuse  $\overline{AC} = 5\text{cm}$ . Also write steps of construction.

**Possible Answer:**

- i. Draw a line segment  $\overline{BC} = 4\text{cm}$
- ii. At B construct  $\angle CBP = 90^\circ$  with the help of compass
- iii. With C as a centre draw arc of radius of 5cm acting BP in A
- iv. Join A with C.

ABC is the required right angled triangle with  $\angle B$  as its right angle.

**Checking Hints:**

Total 6 Marks

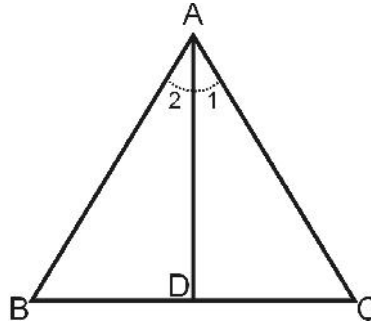
Step 01	Writing	Correct Construction	$0.5 + 0.5 = 1$
Step 02	Writing	Correct Construction	$1 + 1 = 2$
Step 03	Writing	Correct Construction	$1 + 1 = 2$
Step 04	Writing	Correct Construction	$0.5 + 0.5 = 1$

**Q8:**

6 Marks

Prove: *If two sides of a triangle are congruent, then angles opposite to these sides are congruent.*

**Possible Answer:**



Solution: Given  $\triangle ABC$   
 $\overline{AB} \cong \overline{AC}$

To prove

$$\angle B \cong \angle C$$

Construction: Draw bisector of  $\angle A$  which meet BC at point D.

Proof:

Statements	Reasons
If $\triangle ABC \leftrightarrow \triangle ADC$	Given
$m \overline{AB} \cong m \overline{AC}$	Construction
$\angle 1 \cong \angle 2$	Common
$\overline{AD} \cong \overline{AD}$	$S.A.S \cong S.A.S$
So, $\triangle ABC \cong \triangle ADC$	Corresponding angles of congruent triangle
Hence, $\angle B \cong \angle C$	

**Checking Hints:**

Total 6 Marks

1 mark for diagram

1 mark for each statement with reason (5 required)



**Q9:**

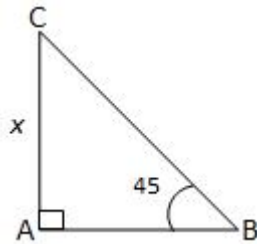
6 Marks

The angle from a point on level ground 40 m from the foot of a tower is 45 degree. What is the height of the tower?

**Possible Answer:**

Distance from foot of tower = 40m  
Angle to the tower =  $45^{\circ}$   
Height of tower = ?

Step -1



Step - 2

In  $\Delta A$

$$\tan \theta = \frac{p}{b}$$

Step - 3

$$\tan 45^{\circ} = \frac{x}{40}$$

Step - 4

$$1 = \frac{x}{40}$$

Step - 5

$$x = 40 \text{ m}$$

Step - 6

**Checking Hints:**

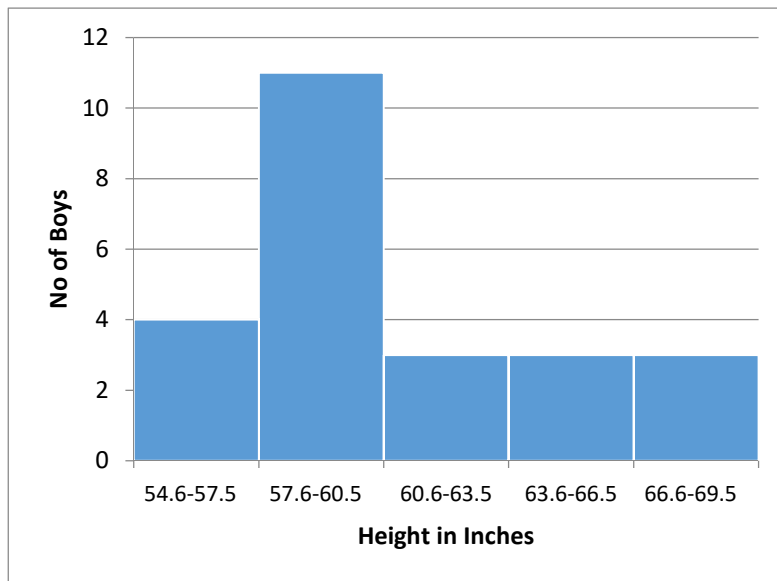
Total 6 Marks

1 mark for each step (6 required)

**Q10:**

**6 Marks**

The given histogram shows height (in inches) of different boys.



1. What is the total number of boys shown in the histogram?
2. How many boys are with height in the range of 60.6 – 63.5 inches?
3. What is the maximum height of the boys?
4. What is the class interval of the given data? Write down the range of the given data?

**Possible Answer:**

1. 24
2. 3
3. 11 inches
4. Class interval: 2.9 Range: 54.6 to 69.5

**Checking Hints:**

Total 6 Marks

1. 1 mark for the number of boys
2. 1 mark for the range
3. 1 mark for the maximum height  
1 mark for the unit
4. 1 mark for the class interval  
1 mark for the range of the data