The City School

PAF Chapter

Comprehensive Worksheet

Answer Key

December 2019

MATHEMATICS

Class – 7

SECTION A

Q1a. Fill in the blanks. [/05]

   a. The sum of the angles in a circle = **360** °

   b. The next two terms of the sequence 2, 9, 16, 23, **30, 37.**

   c. The y-intercept of the line -3x + 5 is **5.**

   d. 0.25 = **25** %

   e. Simple form of 60 : 12 is **5 : 1.**

Q1b. Identify whether the statement is true or false. [/05]

   a. All the integers are rational numbers. **(T)**

   b. $(-2)^3 = 8$ **(F)**

   c. Equation of x-axis is x=0 **(F)**

   d. If a typist types 300 words in 30 minutes his rate of typing is 10 words per minute. **(T)**

   e. If a car travels at an average speed of 120km/h for 2 hours then the distance covered is 240 km. **(T)**

Q2a. Identify which of the following are rational and which of them are irrational? [/05]

Number	Rational	Irrational
8.123	✔	
2π		✔
$\sqrt{9}$	✔	
$\dfrac{22}{7}$	✔	
3.142…		✔

Q2b. find the gradient of each of the following. [/02]

   i. **y = 8 – 2x**

      Gradient = -2

   ii. **3y = 4x + 12**

      Gradient $= \dfrac{4}{3}$

Q2c. Convert $8\frac{1}{4}$ hours into <u>495</u> **minutes.** [/01]

Q2d. Find percentage change in an increase from 120 to 150. [/02]

$\frac{150}{120} \times 100$

` =125%

125 % - 100 % = 25 % (The % increase is 25%)

Q3a. Find the smallest value of m, such that the LCM of m and 34 is 374. [/02]

Prime factors of 34 =2×17

Prime factors of 374 = 2×17×11

m = 11

Q3b. The numbers 240 and 720 are written as the product of their prime factors, are

$$240 = 2^4 \times 3 \times 5$$
$$720 = 2^4 \times 3^2 \times 5$$

Find the H.F.C. [/02]

$$H.F.C = 2^4 \times 3 \times 5$$
$$= 240$$

Q3c. Evaluate the following: [/06]

i.   **4 –[(-2) × 3]**

$4 - [- 6]$

$4 + 6$

$=10$

ii. $-\frac{7}{2} \times \frac{7}{3} \times \frac{5}{7} \times \frac{21}{10}$

$-\frac{49}{4}$

$-12\frac{1}{4}$

Q4a. John spends $5\frac{4}{7}$ hrs for his test preparation. If he spends $\frac{2}{3}$ of his total time on mathematics revision, find the amount of time he spends on Mathematics. [/03]

$$\frac{2}{3} \ of \ 5\frac{4}{7}$$

$$\frac{2}{3} \times \frac{39}{7}$$

$$\frac{26}{7}$$

$$3\frac{5}{7}hrs$$

Q4b. Given that x: 3: 2 = 7 : 5 : y, find the values of x and y. [/04]

Consider x:3=7:5

$$\frac{x}{3} = \frac{7}{5}$$

$$\frac{3}{2} = \frac{5}{y}$$

$5x = 21$

$3y = 10$

$$x = \frac{21}{5}$$

$$y = \frac{10}{3}$$

$$x = 4\frac{1}{5}$$

$$y = 3\frac{1}{3}$$

Consider 3 : 2 = 5 : y

Q4c. If a : b = $\frac{3}{5}$: 4 and b : c = 5 : 6, find a : b : c. [/03]

$a : b = \frac{3}{5} : 4$

$a : b = 3 : 4 \times 5$

$a : b = 3 : 20$

a	:	b	:	c
3	:	20		
		5	:	6
15	:	100	:	120
3	:	20	:	24

SECTION B

Q5a. Micheal sells eggs at \$1.50 per half dozen, whereas Kate sells eggs of the same size at \$ 2.40 per dozen. From whom you will buy the eggs? [/04]

Cost of 1 egg Micheal sells $= \frac{1.50}{6}$

$$\frac{150}{600} = \$0.25$$

Cost of 1 egg Kate sells $= \frac{2.40}{12}$

$$\frac{240}{1200} = \$0.20$$

I'll buy from Kate.

Q5b. A profit of $42500 is divided among three persons x, y and z in the ratio 2: 3: 5. Find the share of each person. [/06]

$$\text{Sum of ratio: } 2+3+5 = 10$$

$$\text{X's share: } \frac{2}{10} \times 42500 = \$\ 8500$$

$$\text{Y's share: } \frac{3}{10} \times 42500 = \$\ 12750$$

$$\text{Z's share: } \frac{5}{10} \times 42500 = \$\ 21250.$$

Q6a. Covert the following: [/02]

i. **250m/s to km/h**

$$\frac{250}{1} \times \frac{3600}{1000}$$

2503.6

900 km/h

ii. **180km/min to m/s**

$$\frac{180}{1} \times \frac{1000}{60}$$

$$= 3000\text{m/s}$$

Q6b. If Jane drives at a speed of 65km/h. Calculate the distance she covered in 2.5 hours. [/02]

Distance covered = Speed × Time

$$= 65 \times \frac{5}{2}$$

$$= 162.5 \text{ km}$$

Q6c. The distance between two towns is 540 km. Train's average speed is 120km/h. Calculate the time taken in hours by the train. [/02]

Speed = Distance ÷ Time

$$= \frac{540}{120}$$

$$= 4\frac{1}{2} \text{ hours}$$

Q6d. George drives first 120 km in $1\frac{1}{2}$ hours and next 180 km at an average speed of 120km/h. What is his average speed for the entire trip in km/h. [/04]

First journey   120 km in $1\frac{1}{2}$ hours

Second journey   180 km at an speed of 120km/h, (time is not given, for average speed of 2 journeys we need to calculate time)

Time = Distance travelled ÷ Speed

$$= \frac{180}{120}$$

$$= 1\frac{1}{2} \text{ hours}$$

Now average speed for 2 journeys,

Average speed =   Total Distance Travelled ÷ Total Time Taken

$$= \frac{120 + 180}{9/2}$$

$$= 300 \div \frac{9}{2}$$

$$= 66.6 \text{ km/h}$$

Q7a.325% of a number is 2600. Find the original number.   [/02]

325% of x = 2600

$$\frac{325}{100} x = 2600$$

$$x = 2600 \times \frac{100}{325}$$

$$= 800$$

Q7b. The result of a number when increased by 12.5% is 90. Find the number.   [/02]

100 + 12.5 = 112.5%

112.5% of x = 90

$$\frac{112.5}{100} x = 90$$

$$x = 90 \times \frac{100}{112.5}$$

$$= 80$$

Q7c. Students at an Engineering College last year received, on an average, $2,950 in scholarships and grant money. This year, the average is 50% higher than the previous year. What is the average this year?   [/02]

Let $ 2,950 be the 100%

50% increase means this year 150%

150% of 2,950

$$\frac{150}{100} \times 2950$$

$$= \$4425$$

Q7d. The value of a wooden table is decreased by 20% of its value in the previous year. If the value of the table in 2019 is $3020. Find its value in 2017(Round off to nearest whole number).   [/04]

Value of wooden table in 2018:

100% - 20 % = 80%

80 % of 3020

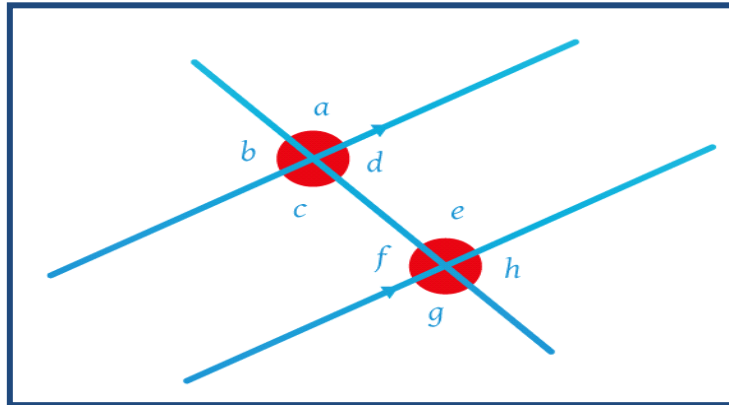$$3020 \times \frac{80}{100}$$

= $ 2416

Value of wooden table in 2017:

100% - 20 % = 80%

$2416 \times \frac{80}{100}$

=$ 1932.8

=$ 1933 (Rounded off)

Q8a. Line m is parallel to line n

i.   **Write down one pair of alternate angles.**   [/01]

(c and e) or (d and f)

ii. **Is angle c + angle h = 180 degrees? Explain your answer.**   [/01]

No. they are not interior angles or adjacent angles. Only adjacent and interior angles sum up to
180 degree.

iii. **If angle g is 117 degrees, calculate angle b.**   [/01]

Angle g + f = 180 degree. So f = 63 degree. (f = 180 − 117=63 degree)

f and b are corresponding angles and they are 63 degrees.

iv. **If angle a is 48 degrees, what will be the value of angle c and angle e?**   [/01]

c = 48 (vertically opposite angles) and e = 48 degrees (corresponding angles)

Q8b. Consider the pattern.

$$\frac{1}{1 \times 2} = \frac{1}{1} - \frac{1}{2}$$

$$\frac{1}{2 \times 3} = \frac{1}{2} - \frac{1}{3}$$

$$\frac{1}{3 \times 4} = \frac{1}{3} - \frac{1}{4}$$

$$\frac{1}{4 \times 5} = \frac{1}{4} - \frac{1}{5}$$

$$\vdots \qquad \vdots$$
$$\frac{1}{240} = \frac{1}{m} - \frac{1}{n}$$

a. Write the 15th row. [/01]

$$\frac{1}{15 \times 16} = \frac{1}{15} - \frac{1}{16}$$

b. Using the pattern find the value of $\frac{1}{12} - \frac{1}{13}$ [/02]

$$\frac{1}{12 \times 13}$$
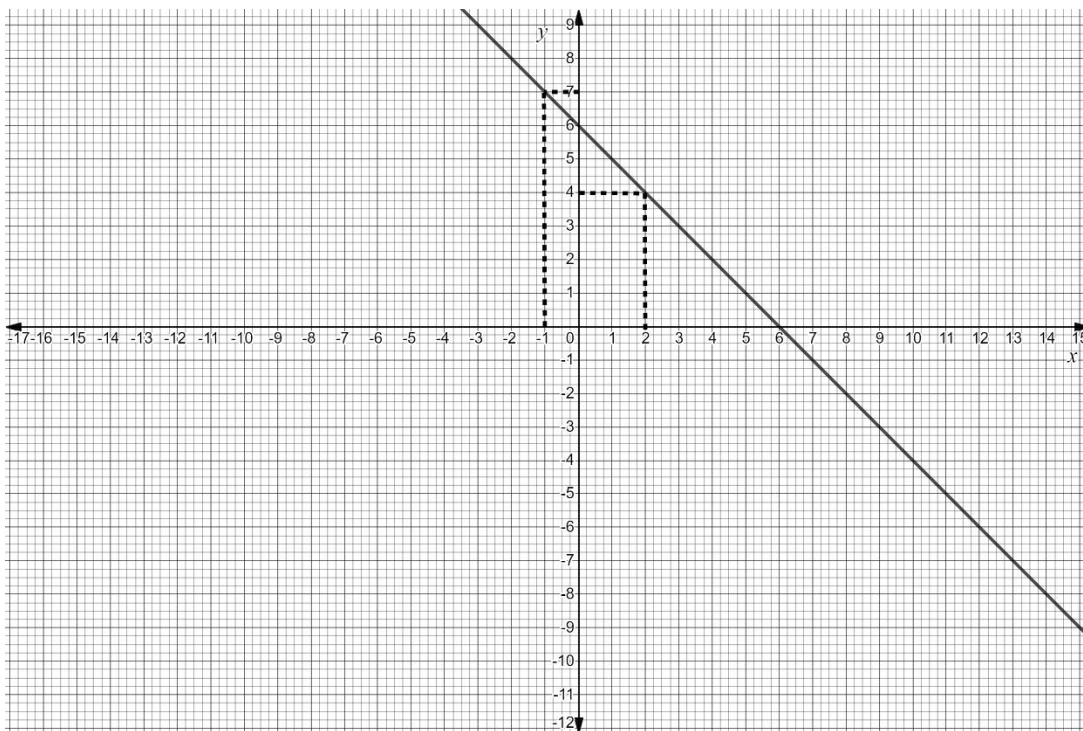$$\frac{1}{156}$$

c. Find the value of m and n. [/03]

$$\frac{1}{15 \times 16} \ (m = 15, n = 16)$$
$$\frac{1}{240}$$

Q9a. On a sheet of graph paper , using a scale of 1 cm to represent 1 unit on both axes , draw the graph of the function y= -x + 6 for values of x from -4 to 4. [/08]

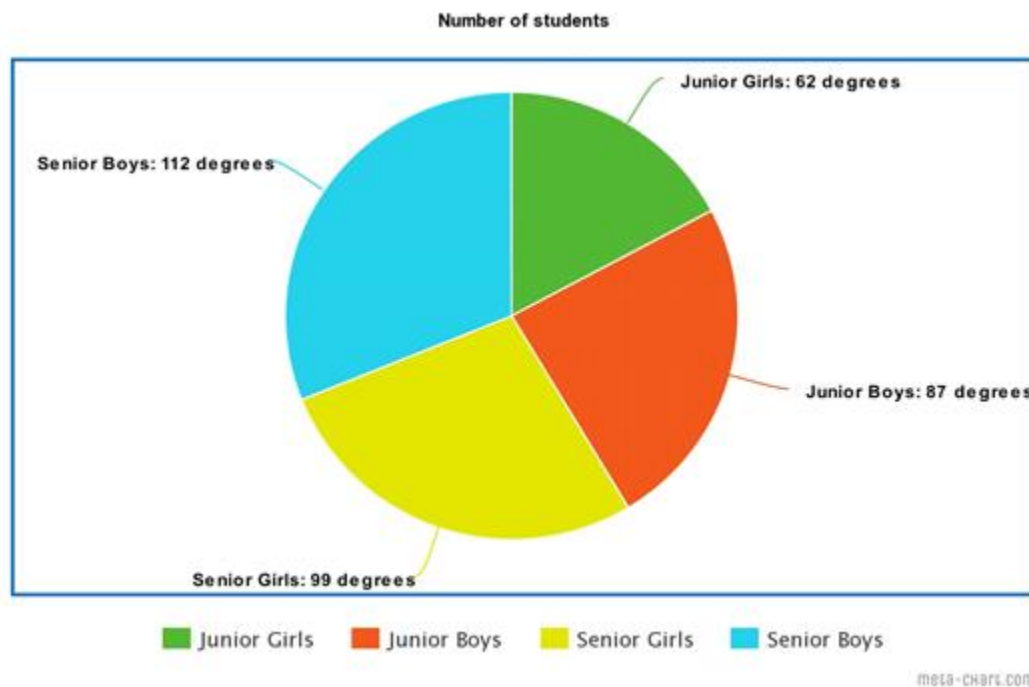| x	-2	0	4
y= -x + 6	8	6	2

Q9b. From the graph find the value of:- [/02]

i.   y when x = -1   **12**

ii.   x when y = 4   **2**

Q10a. The pie chart below shows the students participation from junior and senior section at the

school's

sports   gala.

i.   **What percentage of Junior girls attended the sports gala?**   [/02]

$$\frac{62}{360} \times 100 = 17.2 \%$$

ii.   **There were 70 Junior Boys who attended the sports gala. What was the total number of**
        students who attended the event? Give your answer in whole number.   [/02]

                $70 \times 360 = 87x$ (use the ratio method)

                        $x = 289.65$ (290 rounded off)

iii.   **Hence, find the number of total girls who attended the event? Give the answer in whole**
        number.   [/06]

                ratio method

                total angle of girls :- 161

                total students :- 290

                total angle of circle :- 360

                calculation :- $161 \times \frac{70}{87} = 129.54$ (130)