Section A — X Maths (Standard) 2019-20 — Marking scheme — Marks

1- C - 338 — 1

2- B - $\frac{3}{4}$ — 1

3- C Three place of decimal — 1

4- C 4 units — 1

5- C Infinitely many solutions — 1

6- C 8 sq units — 1

7- C 25 m — 1

8- A -B — 1

9- $x = 42, y = 21$ — 1

10- B = 4 — 1

11- 1 — 1

12- $\angle Q = 45^\circ$ — 1

13- (4, 0) — 1

14- K = 4 — 1

15- 14, 38 or $x^2 + x - 12$

16- Rational no - 2 and irrational no 2.01001000 - - — 1

17- 15B — 1

18- Length of chord = 6 cm or $K = \pm 3$ — 1

19- $\frac{1}{2}$ — 1

20- $\frac{1}{29}$ — 1

Section B

21- $S_n = \frac{n}{2}[a+l]$ — $\frac{1}{2}$

$65 = \frac{n}{2}[-7+29]$ — $\frac{1}{2}$

$\boxed{n = 5}$ $l = 29$, $a + 4d = 29$, $d = 9$ — 1

22- $\text{Cosec}(90 - 5A) = \text{Cosec}(A - 6)$ — $\frac{1}{2}$

$90 - 5A = A - 6$ — $\frac{1}{2}$

$\boxed{A = 16}$ — 1

23- Let $\frac{1}{x} = p$, $y = q$ — $\frac{1}{2}$

$4p + 3q = 8$ — (i)

$6p - 4q = -5$ — (ii) — $\frac{1}{2}$

$\boxed{x = 2, y = 2}$ — 1

24- Fig - — $\frac{1}{2}$

Proving — 1

— $\frac{1}{2}$

24 or Similarity — $1\frac{1}{2}$

Proving — 1

25- $P = l + 2r \Rightarrow l = 10$ — 1

$A = \frac{1}{2} l r = \frac{1}{2} \times 10 \times 5.7$ — $\frac{1}{2}$

$= 28.5 \text{ cm}^2$ — $1\frac{1}{2}$

26- $\pi R^2 = \pi r_1^2 + \pi r_2^2$ $\frac{1}{2}$

$\pi R^2 = \pi(r_1^2 + r_2^2)$

$R^2 = 576 + 49$ $\frac{1}{2}$

$R = 25\text{ cm}$ $\frac{1}{2}$

$d = 50\text{ cm}$ $\frac{1}{2}$

Section C

27- $a_{12} = -13 \Rightarrow a + 11d = -13$ — (1) $\frac{1}{2}$

$S_4 = 24 \Rightarrow 2[2a + 3d] = 24$ $\frac{1}{2}$

$2a + 3d = 12$

$a = 9,\ d = -2$ $\frac{1}{2}$

$S_n = \frac{n}{2}[2a + (n-1)d]$

$S_n = 0$ $1\frac{1}{2}$

28- $g(x) = x^2 - (\alpha + \beta)x + \beta$ $\frac{1}{2}$

$= x^2 - 2$

$q(x) = \frac{2x^4 - 3x^3 - 3x^2 + 6x - 2}{x^2 - 2}$ 1

$= 2x^2 - 3x + 1$

$= 2x^2 - 2x - x + 1$ $1\frac{1}{2}$

$= 2x(x-1) - 1(x-1)$

$= (x-1)(2x-1)$

Zeroes are $\sqrt{2}, -\sqrt{2}, 1, \frac{1}{2}$

29- $152x - 378y = -74$ — (I)

$-378x + 152y = -604$ — (II)

$x + y = 3$ — (III) (2)

$x - y = 1$ — (IV)

$\boxed{x = 2,\ y = 1}$ (1)

OR

Let the Present age of Sonu = y yrs

$\therefore$ Nuri = x yrs $\frac{1}{2}$

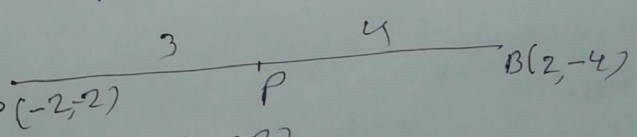
$x - 3y = -10$ — (I) $1\frac{1}{2}$

$x - 2y = 10$ — (II)

$x = 50$ yrs. 1

$y = 20$ yrs

30-



$AP = \frac{3}{7}(AP + BP)$ (1)

$7AP = 3AP + 3BP$

$4AP = 3BP$

$AP : BP = 3 : 4$

cont-

$x = \frac{m_1x_2 + m_2x_1}{m_1 + m_2} = \frac{6-8}{3+4} = -\frac{2}{7}$

$y = \frac{m_1y_2 + m_2y_1}{m_1 + m_2} = \frac{-12-8}{7} = -\frac{20}{7}$ 2

Coordinate of point $P = (-\frac{2}{7}, -\frac{20}{7})$

31- 3 marks for correct Proving 3

OR

For correct Proving 3

32- $\sin^2A + \operatorname{cosec}^2A + 2\sin A \operatorname{cosec} A + \cos^2A + \sec^2A + 2\cos A \sec A$ 1

$= \sin^2A + \cos^2A + \operatorname{cosec}^2A + \sec^2A + 2\sin A \operatorname{cosec} A + 2\cos A \sec A$

$= 1 + 1 + \cot^2A + 1 + \tan^2A + 2\sin A \cdot \frac{1}{\sin A} + 2\cos A \cdot \frac{1}{\cos A}$ 1

$= 1 + 1 + \cot^2A + 1 + \tan^2A + 2 + 2$ 1

$= 7 + \tan^2A + \cot^2A$

OR

3

$\frac{5\cos^2 60^\circ + 4\cos^2 30^\circ - \tan^2 45^\circ}{\cos^2 60^\circ + \sin^2 30^\circ}$

$= \frac{5(\frac{1}{2})^2 + 4(\frac{\sqrt{3}}{2})^2 - (1)^2}{(\frac{1}{2})^2 + (\frac{1}{2})^2}$ 1

$= \frac{\frac{5}{4} + \frac{4\times 3}{4} - 1}{\frac{1}{4} + \frac{1}{4}}$ 1

$= \frac{13}{4} \times \frac{4}{2}$ 1

$= \frac{13}{2}$

33- ~~ar(OABC)~~ ~~ar(OAB)~~ ~~area of shaded region~~

In $\triangle BAC$,

$BC^2 = AB^2 + BC^2$ 1

$= (14)^2 + (14)^2$

$BC = 14\sqrt{2}$ cm

Area of shaded region

$= ar(OABC) + ar(\text{semi circle}) - ar(\text{quadrant})$ 1

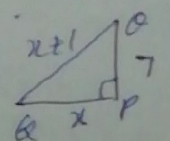
$= \frac{1}{2} \times 14 \times 14 + \frac{1}{2}\pi(7\sqrt{2})^2 - \frac{1}{4}\pi(14)^2$

$= 98 + 49\pi - 49\pi$ 1

$= 98$ cm^2

34- $x = 24$,

$PQ = 24$ cm, $OQ = 25$ cm



$\sin Q = \frac{7}{25}$

$\cos Q = \frac{24}{25}$

$\tan Q = \frac{7}{24}$

1 mark for each

Section D

35- $\frac{1}{2a+b+2x} - \frac{1}{2x} = \frac{1}{2a} + \frac{1}{b}$

$\frac{2x-2a-b-2x}{2x[2a+b+2x)} = \frac{b+2a}{2a \times b}$ 1

$\frac{-(2a+b)}{4x^2+4ax+2bx} = \frac{2a+b}{2ab}$ 1

$4x^2+4ax+2bx+2ab=0$

$4x[x+a]+2b(x+a)=0$ 2

$(x+a)(4x+2b)=0$

$x=-a, -\frac{b}{2}$

35- OR

$\frac{2800}{x-100} - \frac{2800}{x} = \frac{30}{60}$

$2800\left[\frac{1}{x-100} - \frac{1}{x}\right] = \frac{1}{2}$ 1

$2800\left[\frac{x-x+100}{x^2-100}\right] = \frac{1}{2}$

$x^2-100x = 560000=0$ 1

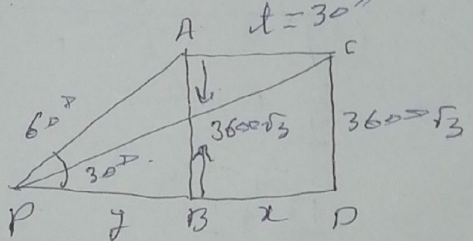
$x = 800 \text{ km/h}$

$t = \frac{2800}{800} = \frac{7}{2} \text{ hr}$ 2

36- For correct Fig, Given and to Prove $1\frac{1}{2}$

For correct Proof

37- $2\frac{1}{2}$



$\sqrt{3} = \frac{3600\sqrt{3}}{y}$ 1

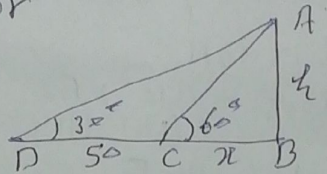
$y = 3600$

$x+y = 10800$ 1

$x = 7200 \text{ m}$

$v = \frac{d}{t} = \frac{7200}{30} \times \frac{3600}{1000} = 864 \text{ km/h}$ 2

OR



$\sqrt{3} = \frac{h}{x} \Rightarrow h = x\sqrt{3}$

$\frac{1}{\sqrt{3}} = \frac{h}{x+50}$ 1

$h = \frac{x+50}{\sqrt{3}} = x\sqrt{3}$ 1

$x = 25$

$h = 25\sqrt{3} \text{ m}$ 2

38- $a+6d = 15, \quad 2a-3d=0$ 1

$a=3, \quad d=2$ 1

A.P $= 3, 5, 7, \ldots$ 1

39- $(x+4)(2x+4) = 160$ 2

$x^2+6x-72=0$ 1

$x = 6$ 1

Their present ages are 6 yrs 12 yrs 1

40- For correct construction 4

Practice Paper I
Class X (2019-20)
Subject: Mathematics Standard (041)

Time: 3Hours Maximum Marks: 80

General Instructions:

1. The question paper consists of 40 questions and it is divided into four sections A,B,C and D.
2. Section A comprises of 20 questions carrying I mark each.
3. Section B comprises of 6 questions carrying 2 marks each.
4. Section C comprises of 8 questions carrying 3 marks each.
5. Section D comprises of 6 questions carrying 4 marks each.

Section - A

1. If HCF of (26, 169) = 13, then LCM (26, 169) is
   (A)26 (B) 52 (C)338 (D)13

2. If A + B = 90^0 and Tan A = ¾ the value of Cot B is
   (A)-I (B)3/4 (C)1 (D) 2

3. The decimal expansion of the rational number $7/2x\ 5^3$ will terminate after
   (A) One decimal place
   (B) Two decimal places
   (C) Three decimal places
   (D) Four decimal places

4. The perpendicular distance of a point A (-3, -4) from X axis Is:
   (A) -4 units (B)-3 units (C)4units **(D) 2 units**

5. The pair of equation 5x- 15y = 8 and $3x - 9y = \frac{24}{5}$ has
   (A) One solution
   (B) Two solutions
   (C) Infinite solutions
   (D) No solutions

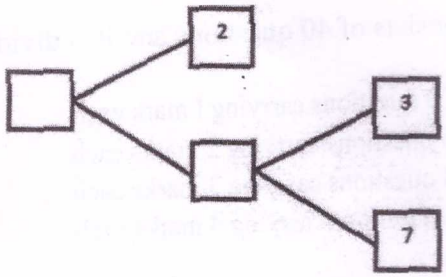
6. The area of a triangle with vertices (3,.0),(7,0)and(8,4)is
   (A) 14sq.units (B) 28sq.units (C) 8sq.units (D) 6 sq.units

7. A tower stands vertically on the ground. From a point on the ground which is 25 m away from the foot of the tower, the angle of elevation of the top of the tower is found to be 45^0. Then the height (in meters) if the tower is
   (A)252 (B)253 (C)25 (D)12.5

8. If P (k/2,4)is the mid-point of line segment joining the points A(-6,5) and B(-2,3),then the value of K is

(A)-8 (B)5 (C)-4 (D)4

9. Complete the missing entries in the following factor tree:



10. If 6, a, 2 are three consecutive terms of an A.P., then find the value of a. is

a. -2 b. 4 c. -4 d. 0

11. Value of $\sec^2\theta - \cot^2(90^0 - \theta)$ is ----------

12. If $\Delta ABC \sim \Delta PQR$, if $\angle B = 45^0$ then the value of $\angle Q$ = ----------

13. Line represented by equation $2x + 3y = 8$ intersects x- axis at ----------

14. If one root of the equation $(K-1)x^2 - 10x + 3 = 0$ is the reciprocal of the other, then the

Value of K is_____

15. Fill the two blanks in the sequence 2, ____ , 26, ____ so that the sequence forms an A.P.

or

A quadratic polynomial, whose zeroes are -3 and 4, is ----------

16. Write one rational and one irrational number lying between 3/2 and 5/2.

17. Find the 20th term from the last of the A.P 3, 8, ---------253.

18. If the radii of two concentric circles are 4 cm and 5 cm, then find the length of achord of biggercircle which is tangent of smaller circle.

Or

Find the value(s) of K for which the quadratic equation $x^2 + 2\sqrt{2}Kx + 18 = 0$ has equal roots.

19. Find the value of $\sin^2 20^0 + \sin^2 70^0$

20. Find the number of natural numbers between 102 and 998 which are divisible by 3.

Section -B

21. In an A.P., the first term is -7,the last term is 29 and sum of the terms is 55. Find the common difference.

22. If $\sec 5A = \operatorname{cosec}(A-6^0)$,where5A is an acute angle, find the value of A.

23. Solve the equations by cross multiplication methods.
$4/x + 3y = 8$ and $6/x - 4y = -5$.

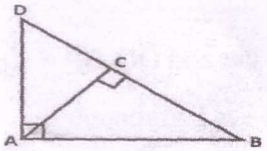
OR

For what value of P the following pair of equations have infinitely many solutions.
$(p-3)\,x+3y = p$ and $px + py = 12$.

24. E is a point on the side AD produced of a parallelogram ABCD and BE intersects CD at F. Show that $\Delta ABE \sim \Delta CFB$.

OR

In figure, ΔABD is a right angle triangle, right angled at A and $AC \perp BD$, Prove that $AB^2 = BC.BD$.



25. The perimeter of sector of a circle of radius 5.7 cm is 21.4 cm find the area of sector.

26. The area of a circle is equal to the sum of the areas of two circles. If the radii of Two circles are 24 cm and 7 cm. Find the diameter of the bigger circle.

Section -C

27. In an A.P., if the 12^{th} term is -13 and the sum of its four terms is 24, find the sum of its first ten terms.

28. Find all the zeros of $2x^4 - 3x^3 - 3x^2 + 6x - 2$, if two of its zeros are $\sqrt{2}$ and $-\sqrt{2}$.

29. Solve for x and y: $152x - 378y = -74$ and $-378x + 152y = -604$.

OR

Five years ago, Nuri was thrice as old as Sonu. Ten years later Nuri will be twice as old as Sonu .Find their present ages.

30. If P divides the line segment joining the points A(-2,—2) and B (2, – 4) such that AP=3/7 AB find the co-ordinate of point P.

31. Prove that $3 - 2\sqrt{5}$ is an irrational number. if $\sqrt{5}$ is an irrational number.

OR

Use Euclid's Division Lemma to show that the square of any positive integer is either of the form 3m or (3m + 1) for semeintegerm.

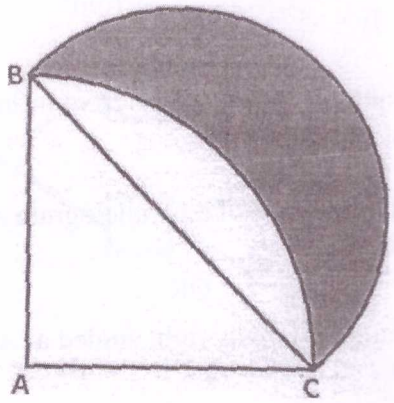
32. Prove that $(\text{Sin}A + \text{Cosec}A)^2 + (\text{Cos}A + \text{Sec}A)^2 = 7 + \text{Tan}^2A + \text{Cot}^2A$

OR

Find the value of $\dfrac{5\cos^2 60^0 + 4\cos^2 30^0 - \tan^2 45^0}{\cos^2 60^0 + \sin^2 30^0}$

$\cos^2 60^0 + \sin^2 30^0$

33. In figure, ABC is a quadrant of a circle of radius 14 cm and a semi-circle is drawn with BC as diameter. Find the area of the shaded region.



34. In Δ OPQ , right angled at P, OP= 7 cm and OQ-QP = 1 cm find the values of sinQ , CosQ and TanQ .

Section –D

35. Solve the following for x:

$$\frac{1}{2a+b+2x} = \frac{1}{2a} + \frac{1}{b} + \frac{1}{2x}$$

OR

In a flight of 2800km, an air craft was slowed down due to bad weather. Its average speed is reduced by100km/h and time increased by 30 minutes. Find the original duration of the flight.

36. Prove that if a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, the other two sides are divided in the same ratio.

37. The angle of elevation of an aeroplane from a point A on the ground is 60°. After a fright of 30 seconds, the angle of elevation changes to 30°. If the aeroplane is flying at constant height of$3600\sqrt{3}$ m find the speed of the aeroplane in km/hour.

Or .

The Shadow of a tower standing on a level ground is found to be 50 meter longer when the Sun's altitude is 30^0 than when it is 60^0. Find the height of the tower.

38. The sum of 5th and 9 th terms of an A.P is 30. If 25th term is 3 times of its 8^{th} . find the A.P

39. The age of a boy is double the age of his brother. After 4 years product of the irages will be 160. Find their present ages.

40. Drawa Δ ABC in which AB= 5.2 cm, $\angle B = 60^0$ and BC= 7 cm then a triangle similar to Δ ABC whose sides are 5/3 times of the sides of triangle ABC.

OR

Draw a pair of tangents to a circle of radius 3cm, which are inclined to each other a tan angle of 60^0.