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# Secondary School Examination-2020

## Marking Scheme - MATHEMATICS STANDARD

## Subject Code: 041 Paper Code: 30 (B)

***General instructions***

1. You are aware that evaluation is the most important process in the actual and correct assessment of the candidates. A small mistake in evaluation may lead to serious problems which may affect the future of the candidates, education system and teaching profession. To avoid mistakes, it is requested that before starting evaluation, you must read and understand the spot evaluation guidelines carefully. **Evaluation is a 10-12 days mission for all of us. Hence, it is necessary that you put in your best effortsin this process.**
2. Evaluation is to be done as per instructions provided in the Marking Scheme. It should not be done according to one's own interpretation or any other consideration. Marking Scheme should be strictly adhered to and religiously followed. **However, while evaluating, answers which are based on latest information or knowledge and/or are innovative, they may be assessed for their correctness otherwise and marks be awarded to them. In class-X, while evaluating two competency based questions, please try to understand given answer and even if reply is not from marking scheme but correct competency is enumerated by the candidate, marks should be awarded.**
3. The Head-Examiner must go through the first five answer books evaluated by each evaluator on the first day, to ensure that evaluation has been carried out as per the instructions given in the Marking Scheme. The remaining answer books meant for evaluation shall be given only after ensuring that there is no significant variation in the marking of individual evaluators.
4. Evaluators will mark( √ ) wherever answer is correct. For wrong answer 'X"be marked. Evaluators will not put right kind of mark while evaluating which gives an impression that answer is correct and no marks are awarded. **This is most common mistake which evaluators are committing.**
5. If a question has parts, please award marks on the right-hand side for each part. Marks awarded for different parts of the question should then be totaled up and written in the left-hand margin and encircled. This may be followed strictly.
6. If a question does not have any parts, marks must be awarded in the left-hand margin and encircled. This may also be followed strictly.
7. If a student has attempted an extra question, answer of the question deserving more marks should be retained and the other answer scored out.
8. No marks to be deducted for the cumulative effect of an error. It should be penalized only once.
9. A full scale of marks **0-80** marks as given in Question Paper) has to be used. Please do not hesitate to award full marks if the answer deserves it.
10. Every examiner has to necessarily do evaluation work for full working hours i.e. 8 hours every day and evaluate 20 answer books per day in main subjects and 25 answer books per day in other subjects (Details are given in Spot Guidelines).
11. Ensure that you do not make the following common types of errors committed by the Examiner in the past:-
    - Leaving answer or part thereof unassessed in an answer book.
    - Giving more marks for an answer than assigned to it.
    - Wrong totaling of marks awarded on a reply.
    - Wrong transfer of marks from the inside pages of the answer book to the title page.
    - Wrong question wise totaling on the title page.
    - Wrong totaling of marks of the two columns on the title page.
    - Wrong grand total.
    - Marks in words and figures not tallying.
    - Wrong transfer of marks from the answer book to online award list.
    - Answers marked as correct, but marks not awarded. (Ensure that the right tick mark is correctly and clearly indicated. It should merely be a line. Same is with the X for incorrect answer.)
    - Half or a part of answer marked correct and the rest as wrong, but no marks awarded.
12. While evaluating the answer books if the answer is found to be totally incorrect, it should be marked as cross (X) and awarded zero (0)Marks.
13. Any unassessed portion, non-carrying over of marks to the title page, or totaling error detected by the candidate shall damage the prestige of all the personnel engaged in the evaluation work as also of the Board. Hence, in order to uphold the prestige of all concerned, it is again reiterated that the instructions be followed meticulously and judiciously.
14. The Examiners should acquaint themselves with the guidelines given in the Guidelines for spot Evaluation before starting the actual evaluation.
15. Every Examiner shall also ensure that all the answers are evaluated, marks carried over to the title page, correctly totaled and written in figures and words.
16. The Board permits candidates to obtain photocopy of the Answer Book on request in an RTI application and also separately as a part of the re-evaluation process on payment of the processing charges.

# QUESTION PAPER CODE 30/B

# EXPECTED ANSWER/VALUE POINTS

## SECTION A

**Question numbers 1 to 10 are multiple choice questions. Choose the correct option.**

**1.** **The decimal representation of $\frac{117}{2^3 5^4 3^2}$ will**

**(A) terminate after 3 decimal places** **(B) terminate after 2 decimal places**

**(C) terminate after 4 decimal places** **(D) not terminate**

**Sol.** (C) Terminate after 4 decimal places. 1

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**2.** **For what value(s) of 'a' will the equations 2x + 3y = 13 and 3x + ay = 18 have no solution?**

**(A) 2** **(B) 4.5** **(C) $\leq 10$** **(D) –4**

**Sol.** (B) 4.5 1

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**3.** **If in $\Delta ABC$, $\angle A = 90°$, then the value of cosec (B + C) is**

**(A) $\frac{2}{\sqrt{3}}$** **(B) $\frac{1}{2}$** **(C) $\frac{\sqrt{3}}{2}$** **(D) 1**

**Sol.** (D) 1 1

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**4.** **Given in the table below are the marks obtained by 50 students in a class test:**

| Marks | 1 – 10 | 10 – 20 | 20 – 30 | 30 – 40 | 40 – 50 |
|---|---|---|---|---|---|
| No. of Students: | 4 | 7 | 19 | 12 | 8 |

**From this data, the lower limit of median class is**

**(A) 10** **(B) 20** **(C) 25** **(D) 30**

**Sol.** (B) 20 1

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**5.** **The LCM of the smallest two-digit number and the largest multiple of 6 which is less than 50 is**

**(A) 2** **(B) 48** **(C) 120** **(D) 240**

**Sol.** (D) 240 1

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**6.** **The value of sin θ cos (90° – θ) + cos θ sin (90° – θ) is**

**(A) 0** **(B) –1** **(C) 1** **(D) $\frac{1}{2}$**

**Sol.** (C) 1 1

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**7. The distance between the points (3, 4) and (–2, –1) is**

**(A)** $5\sqrt{2}$ **(B)** $\sqrt{30}$ **(C)** $6\sqrt{3}$ **(D)** $\sqrt{10}$

**Sol.** (A) $5\sqrt{2}$ 1

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**8. If $P(6, \frac{k}{2})$ is the mid-point of the line segment joining the points A(8, 5) and B (4, 3), then the value of k is**

**(A) –8** **(B) 16** **(C) –6** **(D) 8**

**Sol.** (D) 8 1

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**9. If $\sin\theta = \frac{3}{5}$, then the value of the expression $\frac{5\sin\theta - 2\cos\theta}{\tan\theta}$ is**

**(A)** $\frac{15}{28}$ **(B)** $\frac{28}{15}$ **(C)** $\frac{23}{15}$ **(D)** $\frac{92}{15}$

**Sol.** (B) $\frac{28}{15}$ 1

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**10. The point which divides the line segment joining the points A(2, 3) and B (–3, 4) in the ratio 3 : 4 internally lies in which quadrant?**

**(A) I** **(B) II** **(C) III** **(D) IV**

**Sol.** (B) II 1

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**In question numbers 11 to 15, in each question blanks are to be filled correctly:**

**11. The diameter of a sphere of volume $1437\frac{1}{3}$ Cu. cm is _______ cm. (Use $\pi = \frac{22}{7}$)**

**Sol.** 14 1

---

**12. If 5, b, c, 14 are the consecutive terms of an A.P., then b + c = _______.**

**Sol.** 19 1

**OR**

**The next term of A.P. $\frac{1}{p}, \frac{1-p}{p}, \frac{1-2p}{p}, \ldots$ is _______**

$\frac{1-3p}{p}\left(\text{or } \frac{1}{p}-3\right)$ 1

---

**13. If – 2 is a root of the quadratic equation $3x^2 - 5x + k = 0$, then the value of k is _______.**

**Sol.** $k = -22$ 1

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**14. A number is selected at random from the numbers 1 to 20. The probability that the selected number is a multiple of 3 is _______.**

**Sol.** $\frac{6}{20}$ or $\frac{3}{10}$ 1

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**15. If two triangles ABC and DEF are similar and $\angle A = 67°$, $\angle E = 63°$, then the measure of $\angle C$ is _______.**

**Sol.** 50° 1

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**Answer the question numbers from 16 to 20:**

**16. Write one irrational number between 0.15 and 0.21.**

**Sol.** 0.15010010001 ... (Any relevant answer) 1

**OR**

**Find the HCF of 12, 18 and 30.**

HCF(12, 18) = 6 HCF(6, 30) = 6 $\frac{1}{2}+\frac{1}{2}$

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**17. If a – b, k, a + b and x are four consecutive terms of an A.P., then find the ratio between k and x in terms of a and b.**

**Sol.** Getting K = a, x = a + 2b $\frac{1}{2}$

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

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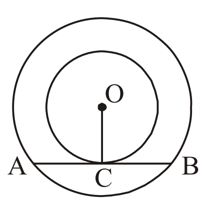
**18. Two concentric circles are of radii 5 cm and 3 cm. Find the length of that chord of the larger circle which touches the smaller circle.**

**Sol.**




BC = 4 cm $\frac{1}{2}$

AB = 8 cm $\frac{1}{2}$

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**19. ABCD is a trapezium in which AB || DC and its diagonals intersect each other at O. If AB = 3 CD, find the ratio of the areas of triangles AOB and COD.**

**Sol.** $\Delta AOB \sim \Delta COD$ (by AA similarity) $\frac{1}{2}$

$$\frac{\text{ar } \Delta AOB}{\text{ar } \Delta OCD} = \frac{AB^2}{CD^2} = \frac{9}{1} \quad \text{or} \quad 9:1$$ $\frac{1}{2}$

**20. Find the value(s) of k for which the roots of the quadratic equation $9x^2 + 3kx + 4 = 0$ are real and equal.**

**Sol.** For roots to be real & equal, $9k^2 - 144 = 0$ $\frac{1}{2}$

which gives $k = \pm 4$ $\frac{1}{2}$

## SECTION B

**Question numbers 21 to 26 carry 2 marks each.**

**21. If the areas of two similar triangles are equal, then prove that the triangles are congruent.**

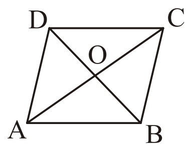
**Sol.** Let $\Delta ABC \sim \Delta PQR$ $\therefore$ $\frac{\text{ar } \Delta ABC}{\text{ar } \Delta PQR} = \frac{AB^2}{PQ^2} = \frac{BC^2}{QR^2} = \frac{AC^2}{PR^2} = 1$ 1

$\therefore$ $AB = PQ$, $BC = QR$, $AC = PR$ $\frac{1}{2}$

$\therefore$ $\Delta ABC \cong \Delta PQR$, (by SSS congruency) $\frac{1}{2}$

**OR**

**Prove that the sum of the squares of the sides of a rhombus is equal to the sum of the squares of its diagonals.**




Let ABCD be given rhombus whose diagonals intersect at O

Clearly $AO^2 + OB^2 = AB^2$ 1

$\Rightarrow \frac{AC^2}{4} + \frac{BD^2}{4} = AB^2$ $\frac{1}{2}$

$\Rightarrow AC^2 + BD^2 = 4AB^2$

$AC^2 + BD^2 = AB^2 + BC^2 + CD^2 + DA^2$ $\frac{1}{2}$

**22. Find the number of numbers lying between 146 and 300 which are divisible by both 3 and 5.**

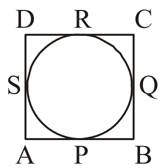
**Sol.** Required numbers are 150, 165, ... 285 1

$150 + (n - 1)15 = 285$ $\frac{1}{2}$

$\Rightarrow n = 10$ $\frac{1}{2}$

**23. Prove that the parallelogram circumscribing a circle is a rhombus.**

**Sol.**




Let ABCD is a parallelogram circumscribing a circle

$$\left.\begin{aligned} \text{Proof: } AP &= AS \\ PB &= BQ \\ DR &= DS \\ CR &= CQ \end{aligned}\right\}$$ 1

adding we get

AB + CD = AD + BC  Note: (Accept, if written directly) $\frac{1}{2}$

$\Rightarrow 2AB = 2AD \Rightarrow AB = AD$ $\frac{1}{2}$

Hence ABCD is a rhombus

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**24.** **100 jugs of equal volume full of water are emptied in a conical flask and the level of water in the flask is 75 cm. If each jug contains 3850 $cm^3$ of water, then find the diameter of the level of water in the flask.**

**Sol.** Let radius of conical flask be r

$$\frac{1}{3}\times\frac{22}{7}\times r^2\times 75 = 3850\times 100$$ 1

gives r = 70 cm $\frac{1}{2}$

So, diameter = 140 cm $\frac{1}{2}$

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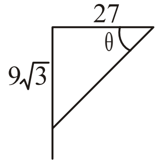
**25.** **On the edge AB of a wall of a house, a projection AP, which is perpendicular to the wall, is erected and its edge is of length 27 cm. A point searchlight is fixed on the corner point P of projection which sends a ray of light PQ such that AQ = $9\sqrt{3}$ cm. If $\angle$APQ = θ, then find the value of (i) θ, and (ii) tan θ + sec θ.**

**Sol.**




(i) $\tan q = \frac{9\sqrt{3}}{27} \Rightarrow q = 30°$ $\frac{1}{2}+\frac{1}{2}$

(ii) $\tan\theta + \sec\theta = \tan 30° + \sec 30° = \frac{1}{\sqrt{3}} + \frac{2}{\sqrt{3}}$ $\frac{1}{2}$

$= \frac{3}{\sqrt{3}}$ or $\sqrt{3}$ $\frac{1}{2}$

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**26. Two friends A and B take their breakfast occasionally in a restaurant which prepares a speciality dish on Monday, Wednesday and Sunday. Each is equally likely to visit the restaurant on any day on which the speciality dish is made. Find the probability that both will enjoy taking the speciality dish on the (i) same day, and (ii) different days.**

**Sol.** (i) Total outcomes = 9 $\frac{1}{2}$

Favourable outcomes are (Monday, Monday)

(Wednesday, Wednesday)

(Sunday, Sunday) i.e. 3 $\frac{1}{2}$

P(same day) = $\frac{3}{9}$ or $\frac{1}{3}$ $\frac{1}{2}$

(ii) P(different days) = $1-\frac{1}{3}=\frac{2}{3}$ $\frac{1}{2}$

**OR**

**Two coins are tossed together. Find the probability of getting (i) both heads, and (ii) exactly one head.**

Total outcomes = 4 1

(i) P(Both heads) = $\frac{1}{4}$, $\{\text{i.e.}\,(HH)\}$ $\frac{1}{2}$

(ii) P(exactly one head) = $\frac{1}{2}$ $\{\text{i.e.}\,(HT),(TH)\}$ $\frac{1}{2}$

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## SECTION C

**Question numbers 27 to 34 carry 3 marks each.**

**27. A number consists of two digits whose sum is 8. If 36 is added to the number, the digits interchange their places. Find the number.**

**Sol.** Let digit at unit place be x & digit at tens place be y

Acc. to Ques. $x + y = 8$ ...(i) $\frac{1}{2}$

$10y + x + 36 = 10x + y$

gives $x - y = 14$ ...(ii) 1

Solving we get x = 6, y = 2 1

$\therefore$ number is 26 $\frac{1}{2}$

**OR**

**Solve for x and y:**

$$\frac{x}{3}+\frac{y}{4}=6, \frac{x}{6}+\frac{y}{2} = 6$$

Given equation can be written as

$4x + 3y = 72,\ x + 3y = 36$ 1+1

Solving we get x = 12, y = 8 $\frac{1}{2}+\frac{1}{2}$

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**28. The first and the last terms of an A.P. are 16 and 136 respectively. If the common difference of the A.P. is 5, then find the number of terms in the A.P. Also find their sum.**

**Sol.** $d = 5,\ a = 16$, last term $= a_n = 136$

$16 + (n - 1)5 = 136$ 1

gives n = 25 $\frac{1}{2}$

$S_{25} = \frac{25}{2}(16+136)$ 1

$= 1900$ $\frac{1}{2}$

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**29. Assuming that $\sqrt{3}$ is an irrational number, prove that $5\sqrt{3} - 7$ is an irrational number.**

**Sol.** Let $5\sqrt{3}-7$ be rational

Let $5\sqrt{3}-7 = x$ 1

gives $\sqrt{3} = \frac{x+7}{5}$ 1

Clearly RHS is rational but LHS is irrational (given)

so our supposition is wrong, hence $5\sqrt{3}-7$ is irrational 1

**OR**

**If the HCF of 65 and 117 is written as 65m – 117, then find the value of m.**

HCF (65, 117) = 13 $1\frac{1}{2}$

65 m – 117 = 13 $\frac{1}{2}$

gives m = 2 1

---

**30.** **If points A(0, 3), B(– 2, a) and C(– 1, 4) are the vertices of a right triangle right-angled at A, then (i) find the value of 'a', (ii) find the length of the longest side, and (iii) find the area of $\Delta$ABC.**

**Sol.** (i) $AB^2 + AC^2 = BC^2 \Rightarrow (a - 3)^2 + 4 + 2 = 1 + (a - 4)^2$ 1

$\Rightarrow \quad a = 1$ $\frac{1}{2}$

(ii) Length of longest side BC = $\sqrt{10}$ $\frac{1}{2}$

(iii) Area = $\frac{1}{2} AB \times CA = \frac{1}{2}\sqrt{2}\sqrt{8} = 2$ 1

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**31.** **Find all the zeroes of the polynomial**

**$2x^4 - 5x^3 - 11x^2 + 20x + 12$**

**if it is given that two of its zeroes are 2 and – 2.**

**Sol.** As 2 & –2 are zeroes $\Rightarrow x^2 - 4$ is a factor 1

$$
\begin{array}{r|l}
x^2 - 4 & 2x^2 - 5x^3 - 11x^2 + 20x + 12 \; (2x^2 - 5x - 3 \\
 & 2x^4 \qquad\quad - 8x^2 \\
 & - \qquad\qquad + \\
\hline
 & \quad - 5x^3 - 3x^2 + 20x + 12 \\
 & \quad - 5x^3 \qquad\quad + 20x \\
 & \quad + \qquad\qquad - \\
\hline
 & \qquad\quad - 3x^2 \qquad + 12 \\
 & \qquad\quad - 3x^2 \qquad + 12 \\
 & \qquad\quad + \qquad\qquad - \\
\hline
 & \qquad\qquad 0
\end{array}
$$

1

Thus other two zeroes are given by $2x^2 - 5x - 3 = 0$

$(2x + 1)(x - 3) = 0$ $\frac{1}{2}$

$\Rightarrow \; x = \frac{-1}{2}, \; 3$

All zeroes are 2, –2, $\frac{-1}{2}$, 3 $\frac{1}{2}$

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**32. Prove that:**

**$(\sin\theta + \operatorname{cosec}\theta)^2 + (\cos\theta + \sec\theta)^2 = 7 + \tan^2\theta + \cot^2\theta$**

**Sol.** LHS = $\sin^2\theta + \operatorname{cosec}^2\theta + 2 + \cos^2\theta + \sec^2\theta + 2$ $1\frac{1}{2}$

$= \sin^2\theta + \cos^2\theta + 1 + \cot^2\theta + 1 + \tan^2\theta + 4$ 1

$= \cot^2\theta + \tan^2\theta + 7 = \text{RHS}$ $\frac{1}{2}$

**OR**

**Find the value of**

$$\frac{-\cot(90^\circ-\theta)\tan\theta + \sec\theta\operatorname{cosec}(90^\circ-\theta) + \sin^2 35^\circ + \sin^2 55^\circ}{\tan 10^\circ \tan 20^\circ \tan 30^\circ \tan 70^\circ \tan 80^\circ}$$

$$\frac{-\tan\theta\cdot\tan\theta + \sec\theta\cdot\sec\theta + \sin^2 35^\circ + \cos^2 35^\circ}{\tan 10^\circ \tan 20^\circ \frac{1}{\sqrt{3}} \cot 20^\circ \cot 10^\circ}$$

Correct numerator 1

Correct denominator 1

$$= \frac{1+1}{\frac{1}{\sqrt{3}}} = 2\sqrt{3}$$ $\frac{1}{2}+\frac{1}{2}$

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**33. The area of an equilateral triangle is $49\sqrt{3}$ cm$^2$. Taking each angular point as centre, circles are drawn with radius equal to half the length of the side of the triangle. Find the area of that part of the triangle which is not included in the circles.**

**(Use $\sqrt{3}$ =1.73, $\pi = \frac{22}{7}$)**

**Sol.** $\frac{\sqrt{3}}{4}a^2 = 49\sqrt{3} \Rightarrow a = 14$ cm $\frac{1}{2}+1$

Area of triangle not included in circle = $49\sqrt{3} - 3\frac{60^\circ}{360^\circ}\times\frac{22}{7}\times 7\times 7$ 1

$$= 49 \times 1.73 - 77$$

$$= 7.77 \text{ cm}^2$$ $\frac{1}{2}$

**34. The number of patients attending a hospital in a month is given in the table below. Find the mean number of patients attending the hospital in a day.**

| **Number of patients** | **Number of days attending hospital** |
|---|---|
| **0 – 10** | **2** |
| **10 – 20** | **6** |
| **20 – 30** | **9** |
| **30 – 40** | **7** |
| **40 – 50** | **4** |
| **50 – 60** | **2** |

**Sol.**

| $x_i$ | 5 | 15 | A = $\boxed{25}$ | 35 | 45 | 55 | Total |
|---|---|---|---|---|---|---|---|
| $f_i$ | 2 | 6 | 9 | 7 | 4 | 2 | 30 |
| $u_i$ | –2 | –1 | 0 | 1 | 2 | 3 | |
| $f_iu_i$ | –4 | –6 | 0 | 7 | 8 | 6 | 11 |

Correct Table 2

$$\bar{x} = A + \frac{\Sigma f_i u_i}{\Sigma f_i} \times h = 25 + \frac{11}{30} \times 10$$ $\frac{1}{2}$

$$= \frac{86}{3} \text{ or } 28.67$$ $\frac{1}{2}$

## SECTION D

**Question numbers 35 to 40 carry 4 marks each.**

**35. Prove that in a right triangle, the square of the hypotenuse is equal to sum of the squares of the remaining two sides.**

**Sol.** For correct Given, to prove $\frac{1}{2}+\frac{1}{2}$

For correct proof 3

**36. Write the steps of construction of a ΔABC in which AB = 5 cm, BC = 6 cm and ∠ABC = 60°. Then write the steps of construction of another triangle whose sides are $\frac{3}{4}$ times the corresponding sides of ΔABC.**

**Sol.** Writing steps for constructing ΔABC 2

Writing steps for constructing triangle similar to ΔABC 2

**OR**

**Write the steps of construction of two tangents to a circle of radius 3 cm which are inclined to each other at an angle of 60°.**

Writing steps for contructing circle & constructing an angle of 120° at centre 2

Writing steps for constructing tangents at both radii 2

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**37. A bucket, open at the top, is in the form of a frustum of a cone with a capacity of 12308.8 cm$^3$. The radii of the top and bottom circular ends are 20 cm and 12 cm respectively. Find the height of the bucket. (Use $\pi$ = 3.14)**

**Sol.** $\frac{1}{3} \times 3.14 \times h \times (400 + 144 + 240) = 12308.8$ 2

$\Rightarrow h = \frac{12308.8 \times 3}{3.14 \times 784}$ 1

$\Rightarrow h = 15$ cm 1

**OR**

**A conical vessel whose internal radius is 5 cm and height 24 cm is full of water. This water is emptied in a cylindrical vessel of internal radius 10 cm. Find the height to which water level rises in the cylindrical vessel.**

$\frac{1}{3}\pi \times 5^2 \times 24 = \pi \times 10^2 \times h$ $1\frac{1}{2} + 1\frac{1}{2}$

$\Rightarrow h = 2$ cm 1

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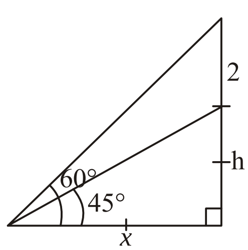
**38. A statue 2 m tall, stands on the top of a pedestal. From a point on the ground, the angle of elevation of the top of the statue is 60° and from the same point the angle of elevation of the top of the pedestal is 45°. Find the height of the pedestal. (Use $\sqrt{3}$ = 1.73)**

**Sol.**




$\frac{h}{x} = \tan 45° \Rightarrow x = h$ 1

$\therefore \frac{h+2}{h} = \tan 60°$ 1

$\Rightarrow h + 2 = \sqrt{3}h$

$$h = \frac{2}{\sqrt{3}-1}$$ 1

$$\text{i.e. } h = \frac{\cancel{2}(\sqrt{3}-1)}{\cancel{2}} = 2.73\text{ m}$$ 1

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**39.** **The sum of the areas of two squares is 640 m$^2$. If the difference of their perimeters be 64 m, find the sides of the two squares.**

**Sol.** Let sides of larger & smaller squares be x & y respectively

$x^2 + y^2 = 640$ ...(i) 1

$4x - 4y = 64 \Rightarrow x = 16 + y$ ...(ii) 1

By (i) and (ii) $y^2 + 16y - 192 = 0$ 1

Solving we get $y = -24$ or $y = 8$ $\frac{1}{2}$

Thus, side of smaller square = 8 cm & that of larger square = 24 cm $\frac{1}{2}$

**OR**

**Solve for x:**

$$\frac{1}{x+4} - \frac{1}{x-7} = \frac{11}{30},\ x \neq -4,\ 7$$

$$\frac{-11}{x^2 - 3x - 28} = \frac{11}{30}$$ 2

$\Rightarrow\ x^2 - 3x + 2 = 0$ 1

Solving we get $x = 2$, $x = 1$ 1

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**40.** **If the median of the following distribution is 28.5, then find the values of x and y:**

| Class Interval | Frequency |
|---|---|
| 0 – 10 | 5 |
| 10 – 20 | x |
| 20 – 30 | 20 |
| 30 – 40 | 15 |
| 40 – 50 | y |
| 50 – 60 | 5 |
| Total | 60 |

**30(B)**

**Sol.**

| **C.I.** | **f** | **cf** |
|---|---|---|
| 0-10 | 5 | 5 |
| 10-20 | x | 5 + x |
| 20-30 | 20 | 25 + x |
| 30-40 | 15 | 40 + x |
| 40-50 | y | 40 + x + y |
| 50-60 | 5 | 45 + x + y |
| Total | 60 | |

Correct Table 1

$x + y = 15$ 1

$$28.5 = 20 + \frac{30 - 5 - x}{20} \times 10$$ 1

give $x = 8,\ y = 7$ $\frac{1}{2} + \frac{1}{2}$