

# PRACTICE PAPER 5

CLASS X

TIME: 3 Hours

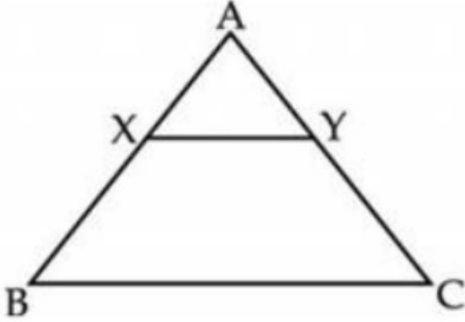
SUBJECT: MATHEMATICS (BASIC)

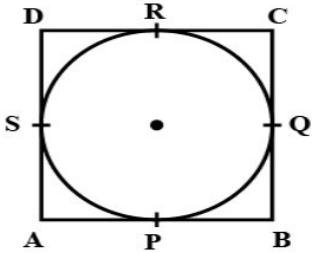
MAX MARKS: 80

## General Instructions:

- 1 This Question Paper has 5 Sections A-E.
- 2 Section A has 20 MCQs carrying 1 mark each.
3. Section B has 5 questions carrying 02 marks each.
4. Section C has 6 questions carrying 03 marks each.
5. Section D has 4 questions carrying 05 marks each.
6. Section E has 3 case based integrated units of assessment (04 marks each) with sub-parts of the values of 1, 1 and 2 marks each respectively.
7. All Questions are compulsory. However, an internal choice in 2 Qs of 2 marks, 2 Qs of 3 marks and 2 Questions of 5 marks has been provided. An internal choice has been provided in the 2 marks Questions of Section E.
8. Draw neat figures wherever required. Take  $\pi = 22/7$  wherever required if not stated.

SECTION A		
	Section A consists of 20 questions of 1 mark each	
Q No.		MARKS
1	$(7 \times 11 \times 13 \times 15) + 15$ is a a) composite number      b) whole number c) prime number          d) both (a) and (b)	1
2	The ratio of LCM and HCF of the least composite and the least prime number is a) 1:2                      b) 2:1                      c) 1:1                      d) 1:3	1
3	The pair of linear equations $7x - 3y = 4$ and $14x + 4y = 5$ have a) one solution      b) two solutions      c) many solutions      d) no solutions	1
4	An integer when added to its square equals to 182. Then one of the integers is a) -15                      b) -14                      c) -13                      d) 14	1
5	If $x = 3$ is one root of the quadratic equations $x^2 - 2kx - 6 = 0$ then the value of k is a) 1                          b) 2                          c) $\frac{1}{2}$ d) $\frac{1}{3}$	1
6	If $A\left(\frac{m}{3}, 5\right)$ is the mid point of the line segment joining the points Q (-6,7) and R (-2,3) then the value of m is a) -12                      b) -4                      c) 12                      d) -6	1

7	<p>In figure given below <math>XY \parallel BC</math> and <math>AX:XB=1:3</math>. The length of <math>XY</math> is</p>  <p>a) 1 cm                  b) 2cm                  c) 3cm                  d) 1.5cm</p>	1
8	<p><math>\triangle ABC \sim \triangle DEF</math>. If <math>AB = 4</math> cm, <math>BC = 3.5</math> cm <math>CA = 2.5</math>cm and <math>DF = 7.5</math>cm then the perimeter of <math>\triangle DEF</math> is</p> <p>a) 10cm                  b) 14cm                  c) 30cm                  d) 25cm</p>	1
9	<p>If two tangents inclined at an angle of <math>60^\circ</math> are drawn to a circle of radius 3cm then the length of each tangent is</p> <p>a) <math>\frac{3\sqrt{3}}{2}</math>cm                  b) 3cm                  c) 6cm                  d) <math>3\sqrt{3}</math> cm</p>	1
10	<p><math>4 \tan^2 A - 4 \sec^2 A =</math></p> <p>a) 1                  b) -1                  c) 4                  d) -4</p>	1
11	<p>If <math>\sin\theta - \cos\theta = 0</math> then the value of <math>(\sin^{4\theta} + \cos^{4\theta})</math> is</p> <p>a) 1                  b) <math>\frac{3}{4}</math>                  c) <math>\frac{1}{2}</math>                  d) <math>\frac{1}{4}</math></p>	1
12	<p>The value of <math>x</math> if <math>\tan(3x - 15^\circ) = \sqrt{3}</math> is</p> <p>a) <math>20^\circ</math>                  b) <math>15^\circ</math>                  c) <math>25^\circ</math>                  d) <math>30^\circ</math></p>	1
13	<p>If the perimeter of a semicircular protractor is 36cm then its diameter is</p> <p>a) 10 cm                  b) 12 cm                  c) 14 cm                  d) 15 cm</p>	1
14	<p>What is the length of the arc of the sector of a circle with radius 28 cm and of central angle <math>90^\circ</math>?</p> <p>a) 22 cm                  b) 44 cm                  c) 88 cm                  d) 11cm</p>	1
15	<p>If two cubes of edge 4 cm each are joined end to end then the surface area of resulting cuboid is</p> <p>a) <math>80 \text{ cm}^2</math>                  b) <math>120 \text{ cm}^2</math>                  c) <math>160 \text{ cm}^2</math>                  d) <math>320 \text{ cm}^2</math></p>	1

16	If the mode of a data is 53 and mean is 33, then its median is a) 36.97      b) 38      c) 40      d) 39.67	1										
17	The median class of the following data is <table border="1" style="margin-left: auto; margin-right: auto;"> <tbody> <tr> <td>C.I</td> <td>20 - 25</td> <td>25 - 30</td> <td>30 - 35</td> <td>35 - 40</td> </tr> <tr> <td>Frequency</td> <td>5</td> <td>8</td> <td>3</td> <td>2</td> </tr> </tbody> </table> a) 20-25      b)30-35      c)25-30      d)35-40	C.I	20 - 25	25 - 30	30 - 35	35 - 40	Frequency	5	8	3	2	1
C.I	20 - 25	25 - 30	30 - 35	35 - 40								
Frequency	5	8	3	2								
18	The probability that a leap year selected at random will contains 53 Sundays is a) $\frac{1}{7}$ b) $\frac{2}{7}$ c) 0      d) $\frac{5}{7}$	1										
19	<b>Assertion:</b> If the product of two numbers is 5780 and their HCF is 17 then their LCM is 340. <b>Reason:</b> HCF is always a factor of LCM. a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A). b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A). c) Assertion (A) is true but reason (R) is false. d) Assertion (A) is false but reason (R) is true.	1										
20	<b>Assertion:</b> The ratio in which the point (-3, k) divides the line segment joining the points (-5,4) and (-2,3) is 1 : 2. <b>Reason:</b> Mid-point of a line segment divides line in the ratio 1:1. a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A). b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A). c) Assertion (A) is true but reason (R) is false. d) Assertion (A) is false but reason (R) is true.	1										
<b>SECTION B</b>												
Section B consists of 5 questions of 2 marks each												
21	For what value of k, the system of equations $kx + 3y = 1$ and $12x + ky = 2$ has no solution.	2										
22	A quadrilateral ABCD is drawn to circumscribe a circle. Prove that $AB + CD = AD + BC$  <div style="text-align: center;">  </div>	2										

	<b>OR</b>	
	Two concentric circles of radii 5 cm and 3cm. Find the length of the chord of the larger circle which touches the smaller circle.	
<b>23</b>	D is a point on the side BC of a triangle ABC such that $\angle ADC = \angle BAC$ , show that $CA^2 = CB \cdot CD$	<b>2</b>
	<b>OR</b>	
	A vertical pole of length 6 cm casts a shadow 4 m long on the ground and at the same time a tower casts a shadow 28 cm long. Find the height of the tower.	
<b>24</b>	If $\tan(2A + B) = \sqrt{3}$ , $\cot(3A - B) = \sqrt{3}$ find A and B	<b>2</b>
<b>25</b>	Find the area of a quadrant of a circle whose circumference is 22 cm.	<b>2</b>
	<b>SECTION C</b>	
	Section C consists of 6 questions of 3 marks each	
<b>26</b>	Show that $5 - 2\sqrt{7}$ is an irrational number where $\sqrt{7}$ is given to be irrational.	<b>3</b>
	<b>OR</b>	
	Two numbers are in the ratio 21 : 17. If their HCF is 5, find the numbers.	
<b>27</b>	The ratio of incomes of two persons is 9:7 and the ratio of their expenditure is 4:3. If each of them manages to save Rs 2000 per month, find their monthly incomes.	<b>3</b>
<b>28</b>	Prove that the lengths of tangents drawn from an external point to a circle are equal.	<b>3</b>
<b>29</b>	Prove that $\frac{\sin\theta - 2\sin^3\theta}{2\cos^3\theta - \cos\theta} = \tan\theta$	<b>3</b>
<b>30</b>	Find the zeroes of polynomial $4\sqrt{3}x^2 + 5x - 2\sqrt{3}$ and verify the relationship between zeroes of a polynomial and coefficients.	<b>3</b>
<b>31</b>	A box contains 90 discs which are numbered from 1 to 90. If one disc is drawn at random from the box, find the probability that it bears i) A two-digit numbers ii) A perfect square number iii) A number divisible by 5.	<b>3</b>
	<b>SECTION D</b>	
	Section D consists of 4 questions of 5 marks each	
<b>32</b>	An aeroplane left 30 minutes later than its scheduled time and in order to reach its destination 1500 km away in time, it had to increase its speed by 250 km/hr. from its usual speed. Find its usual speed.	<b>5</b>
	<b>OR</b>	

	Two water taps together can fill the tank in $9\frac{3}{8}$ hours the larger tap takes 10 hours less than the smaller one to fill the tank separately. Find the time in which each tap can separately fill the tank.																			
<b>33</b>	State and prove Basic Proportionality theorem. Hence prove that a line drawn through the mid -point of one side of a triangle parallel to another side bisects the third side.	<b>5</b>																		
<b>34</b>	A tent is in the shape of a cylinder surmounted by a conical top. If the height and diameter of the cylindrical part are 2.1 m and 4 m respectively, and slant height of the top is 2.8 m, find the area of the canvas used for making the tent. Also find the cost of the canvas of the tent at the rate of Rs 500 per m <sup>2</sup> .  <b>OR</b>  A pen stand made of wood is in the shape of a cuboid with four conical depressions to hold pens. The dimensions are 15 cm by 10 cm by 3.5 cm. The radius of each depression is 0.5 cm and the depth is 1.4 cm. Find the volume of wood in the entire stand.	<b>5</b>																		
<b>35</b>	The median of the following data is 32.5 <table border="1" style="margin-left: auto; margin-right: auto;"><thead><tr><th>Class Interval</th><th>Frequency</th></tr></thead><tbody><tr><td>0 – 10</td><td>x</td></tr><tr><td>10 -20</td><td>5</td></tr><tr><td>20 -30</td><td>9</td></tr><tr><td>30 -40</td><td>12</td></tr><tr><td>40 -50</td><td>y</td></tr><tr><td>50 -60</td><td>3</td></tr><tr><td>60 -70</td><td>2</td></tr><tr><td>TOTAL</td><td>40</td></tr></tbody></table> Find the values of x and y.	Class Interval	Frequency	0 – 10	x	10 -20	5	20 -30	9	30 -40	12	40 -50	y	50 -60	3	60 -70	2	TOTAL	40	<b>5</b>
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	<b>SECTION E</b>																			
	Case study based questions are compulsory																			
<b>36</b>	<b><u>Case study – 1</u></b>																			

Your friend Veer wants to participate in a 200 m race. He can currently run that distance in 51 seconds and with each day of practice, it takes him 2 seconds less. He wants to do in 31 seconds



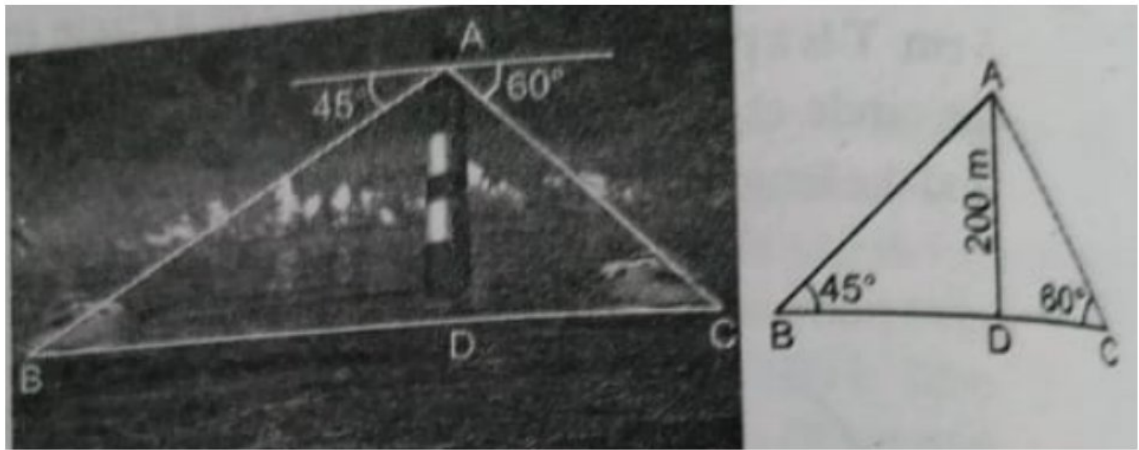
Based on the above information, answer the following questions:

<b>i)</b>	Form an A.P representing the arithmetic progression for the given situation	<b>1</b>
<b>ii)</b>	What is the minimum number of days required to achieve the goal	<b>1</b>
<b>iii)</b>	If nth term of an AP is given by $a_n = 2n + 3$ , then find the common difference of the AP.	<b>2</b>
<b>OR</b>		
	Find the value of x, for which $2x, x+ 10, 3x + 2$ are three consecutive terms of an AP.	

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**Case study – 2**

Two ships are there in the sea on either side of a lighthouse in such a way that the ships and the lighthouse are in the same straight line. The angles of depression of the two ships as observed from the top of the lighthouse are  $60^\circ$  and  $45^\circ$ . The height of the lighthouse is 200 m



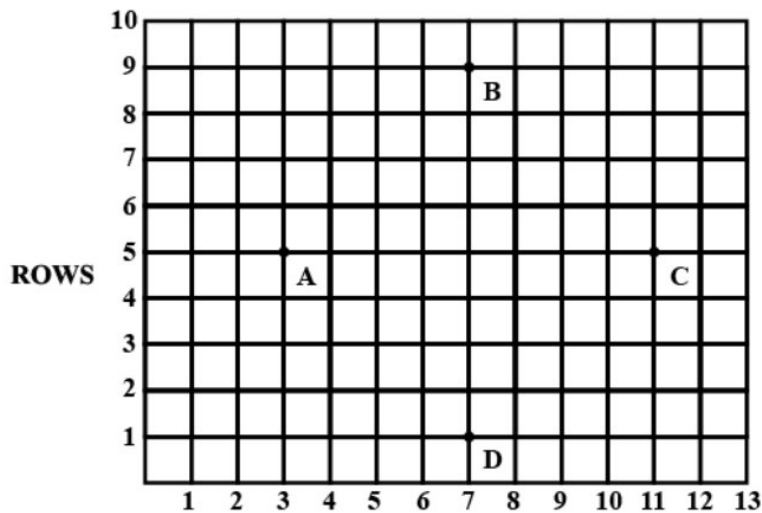
Based on the above information, answer the following questions:

<b>i)</b>	Find the distance of the first ship from the base of the lighthouse.	<b>1</b>
<b>ii)</b>	What is the distance between the two ships?	<b>2</b>
<b>iii)</b>	What is the distance of the first ship from the point of observation?	<b>2</b>
<b>OR</b>		
	What is the distance of the second ship from the point of observation?	

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**Case study – 3**

Students of DAV Public School are standing in rows and columns in their playground for a drill practice. A, B, C and D are the positions of four students as shown in figure



Based on the above information, answer the following questions:

<b>i)</b>	Find the mid-point of BD.	<b>1</b>
<b>ii)</b>	Find the distance between A and D.	<b>1</b>

	<p><b>iii)</b> If the point P divides the line segment AC in the ratio 1:2, then find the coordinate of P.</p> <p style="text-align: center;"><b>OR</b></p> <p>Find the position of Jaspal standing in such a way that he is equidistant from each of the four-student A, B, C and D.</p>	<b>2</b>
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