MIXED BAG TEST PAPER – TERM I

1. If $a^x = b^y = c^z$ and $b^2 = ac$, prove that $y = \dfrac{2xz}{x+z}$

2. Factorize: $(x^2 - 4x)(x^2 - 4x - 1) - 20$

3. The cost of 5 kg of sugar and 7 kg of rice is 153 and the cost of 7 kg of sugar and 5 kg of rice is 147. Find the cost of 7 kg of sugar and 11 kg of rice.

4. Find the value of the following by using identities
   a. $(99.9)^2$
   b. 108×92
   c. $1 - 0.81$

5. There are 38 coins in a collection of 20 paise coins and 25 paise coins. If the total value of the collection is 8.50, how many coins of each are there?

6. In the figure angle $\angle PSQ = 90$ degree $PQ = 10$ cm, $QS = 6$ cm $QR = 9$ cm. Calculate the length of PR.
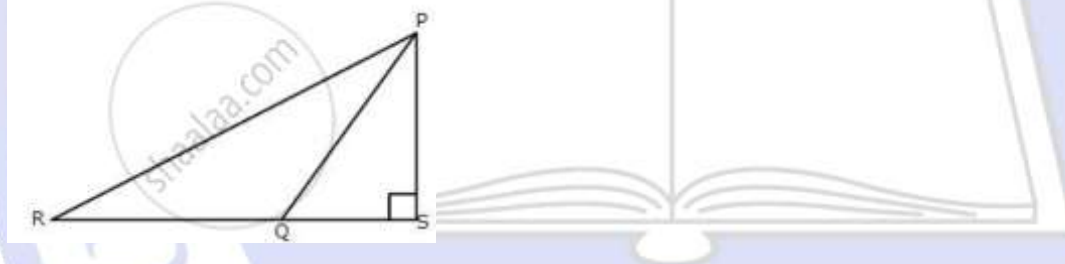
7. In a right-angled triangle, if the hypotenuse is 20 cm and the ratio of the other two sides is 4:3, find the sides.

8. Factorize: $27 - 125a^3 - 135a + 225a^2$

9. $\left(\dfrac{x^{-1}y^2}{x^3y^{-2}}\right)^{1/3} + \left(\dfrac{x^6y^{-3}}{x^{-2}y^3}\right)^{1/2} = x^a y^b$, Prove that $a + b = -1$,
   where x and y are different positive primes.

10. Use the table given below to find:
    (a) The actual class limits of the fourth class.
    (b) The class boundaries of the sixth class.
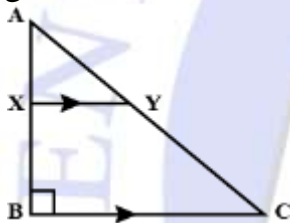   (c) The class-mark of the third class.

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(d) The upper and lower limits of the fifth class.

(e) The size of the third class.

Class interval	Frequency
30-34	7
35-39	10
40-44	12
45-49	13
50-54	8
55-59	4

11. Assuming that x,y ,z are positive real numbers, simplify $\left(\sqrt{x}\right)^{-2/3}\sqrt{y^4} + \sqrt{xy^{-1/2}}$

12. In the given figure $\angle B = 90^0$, XY ∥ BC AB = 12cm, AY = 8 cm AX : XB = 1:2. Find the lengths of AC and BC.

13. If a, b, c are distinct positive prime integers such that $a^2 b^3 c^4 = 49392$, find the values of a, b and c

14. Find the value of: $(x + y + 2z)(x^2 + y^2 + 4z^2 - xy - 2yz - 2zx)$

15. In triangle ABC , given below AB = 8 cm, BC = 6 cm and AC = 3 cm. Calculate the length of OC.
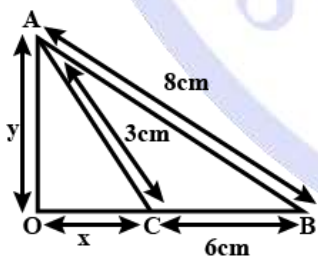
16. If $a - b = 7$, $ab = 30$, Find $a^3 - b^3$

17. If two is added to the numerator of a proper fraction, it becomes equal to 1. If 1 is added to the denominator, it equals 1/2 . Find the fraction.

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18. Factorize: $a^3 - 0.216$

19. Find the value of $\dfrac{0.87 \times 0.87 \times 0.87 + 0.13 \times 0.13 \times 0.13}{0.87 \times 0.87 - 0.87 \times 0.13 + 0.13 \times 0.13}$

20. *Factorise each of the following expression :*
   (i) $a^3 x + a^2(x - y) - a(y + z) - z$
   (ii) $(x^2 + 3x)^2 - 5(x^2 + 3x) - y(x^2 + 3x) + 5y$