Tender Heart High School, Sector 33B, Chd

Class 9th

Mathematics

Ms. Reena

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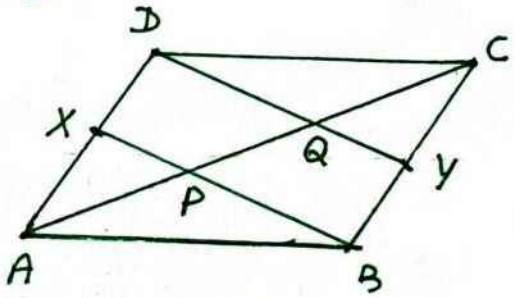
Question 1

(a) If $a^2+b^2+c^2 = 89$ and $ab-bc-ca = 16$, find $a+b-c$

(b) Factorise $3a^7b - 81a^4b^4$

(c) ABCD is a parallelogram X, Y are mid-points of AD, BC respectively. Show that $AP = PQ = QC$



(d) Solve :- (i) $3^{2x+1} = 1$ (ii) $9 \times 3^x = (27)^{2x-5}$

Question 2

(a) Expand $\left(3x - \frac{1}{2x} + 5\right)^2$

(b) Factorise $x^3 - 8$

(c) What sum of money will amount to ₹7840 in 2 years at 12% per annum, compounded annually?

Question 3

(a) Expand $\left(\frac{2}{3}x - \frac{3}{2x} - 1\right)^2$

(b) Factorise $8x^3 - 27$

(c) If ₹6400 is invested at $6\frac{1}{4}$% p.a., compound interest then find (i) the amount after 2yrs (ii) compound interest in 2 years.

Question 4

(a) Expand $(5x - 3y)^3$

(b) The sum of two numbers is 69 and their difference is 17. Find the numbers.

(c) Given $\frac{4+\sqrt{5}}{3+\sqrt{5}} = a - b\sqrt{5}$, find a and b

Question 5

(a) Factorize $6x^2 + 7x - 5$

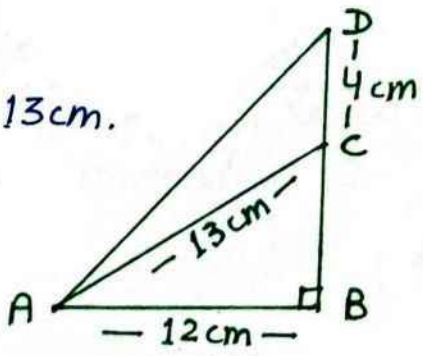
(b) If $x - \frac{1}{x} = 3$, evaluate $x^3 - \frac{1}{x^3}$

(C) In an equilateral triangle ABC, if $AD \perp BC$, prove that $3(AB)^2 = 4(AD)^2$

Question 6

(a) If $a^2 - 5a + 1 = 0$ and $a \neq 0$, find $a^2 + \frac{1}{a^2}$

(b) In the given figure, the length of AB is 12cm, CD is 4cm, AC is 13cm. If $\angle ABD = 90^\circ$, find the length of AD.



(C) Represent the following on number line

(i) $\frac{7}{5}$ (ii) $-\frac{9}{4}$

Question 7

(a) Express $2.\overline{17}$ as a rational number in the simplest form, $\frac{p}{q}$.

(b) At what rate per cent per annum will a sum of ₹ 4000 yield ₹ 1324 as compound interest in 3 years ?

Question 8

(a) Factorise $5(3a+b)^2 + 6(3a+b) - 8$

(b) Arrange the following in descending order

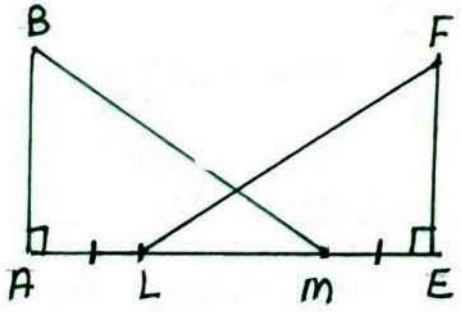
$6\sqrt{2}$, $2\sqrt{6}$, $\sqrt{12}$, $4\sqrt{3}$

(c) Simplify $\left(\frac{a^m}{a^{-n}}\right)^{m-n} \times \left(\frac{a^n}{a^{-l}}\right)^{n-l} \times \left(\frac{a^l}{a^{-m}}\right)^{l-m}$

Question 9

(a) In the given figure, $AB = EF$, $AL = ME$ and $\angle A = \angle E = 90°$

Prove that $LF = MB$



(b) Express $1.\overline{23}$ as a rational number in the simplest form, $\frac{p}{q}$.

(c) How much will a sum of ₹ 6000 amount to in $1\frac{1}{2}$ years at 10% per annum compound interest, interest being payable half-yearly?

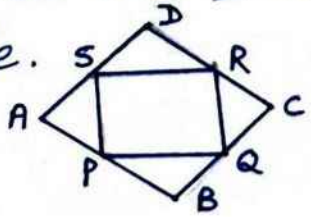
Question 10

(a) If a and b are rational numbers, find the values of a and b from the following equation

$$\frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}} = a + b\sqrt{6}$$

(b) What sum of money will amount to ₹ 3327.50 in 3 years at 10% p.a.?

(c) The mid-points of the sides of a rhombus are joined consecutively. Prove that the quadrilateral thus formed is a rectangle.



Question 11

(b) Simplify $4\sqrt[3]{16} - 3\sqrt[3]{54} + 4\sqrt[3]{192} - 3\sqrt[3]{375}$

[Note: All terms are cube roots]

(c) Find the amount of the compound interest on ₹ 15000, compounded annually at the rates of interest 5%, 8% and 10% for three consecutive years respectively.