Holiday Homework (Summer Break 2017-18)

Class - IX Sub - Maths.

Q1 Find four irrational numbers between 0·1 and 0·2.

Q2 Find two rational numbers lying between $\frac{1}{3}$ and $\frac{1}{2}$

Q3 Express $0.1\overline{23}$ in the form of $\frac{p}{q}$ where p and q are integers and $q \neq 0$. [Ans $\frac{61}{495}$]

Q4 Express $\frac{2}{3}\sqrt{18}$ as a pure surd. [Ans 8]

Q5 If $\frac{6}{3\sqrt{2}-2\sqrt{3}} = a\sqrt{2} + b\sqrt{3}$, find the value of a and b. [Ans a=3; b=2]

Q6 Simplify

(a) $\frac{1}{(27)^{-1/3}} + \frac{1}{(625)^{-1/4}}$ [Ans 8]

(b) If $a = \frac{2-\sqrt{5}}{2+\sqrt{5}}$ and $b = \frac{2+\sqrt{5}}{2-\sqrt{5}}$, find $a^2 - b^2$ [Ans $-144\sqrt{5}$]

Q7 Express $\sqrt{8.47}$ on the real number line with justification.

Q8 Simplify $\frac{3}{5-\sqrt{3}} + \frac{2}{5+\sqrt{3}}$ [Ans $\frac{25+\sqrt{3}}{22}$]

Q9 If $x = (3-2\sqrt{2}$. Show that $\sqrt{x} - \frac{1}{\sqrt{x}} = \pm 2$

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Q10 If $\left(\frac{a}{b}\right)^{x-2} = \left(\frac{b}{a}\right)^{x-4}$, find the value of x. [Ans $x=3$]

Q11 Prove that $\left(\frac{81}{16}\right)^{-\frac{3}{4}} \times \left\{\left(\frac{25}{9}\right)^{-\frac{3}{2}} \div \left(\frac{5}{2}\right)^{-3}\right\} = 1$

Q12. Divide $16\sqrt{75}$ by $5\sqrt{12}$ [Ans 8]

Q13. Find the value of $(625)^{0.16} \times (625)^{0.09}$ [Ans 5]

Q14 Find the value of $\frac{\sqrt{48}+\sqrt{32}}{\sqrt{27}+\sqrt{18}}$ [Ans $\frac{4}{3}$]

Q15 Factorize the following

(a) $x^2 - 1 - 2a - a^2$

(b) $2\sqrt{2}a^3 + 3\sqrt{3}b^3 + c^3 - 3\sqrt{6}abc$

(c) $a^6 - b^6$

(d) $(x^2-4x)(x^2-4x-1) - 20$

(e) $4\sqrt{3}x^2 + 5x - 2\sqrt{3}$

Q16 If $(x+1)$ is a factor of (x^3+a) find the value of a [Ans $a=2$]

Q17 If $f(x) = x^4 - 2x^3 + 3x^3 + 3x^2 - ax - b$ when divided by $(x-1)$, the remainder is 6, find the value of $a+b$

Q18 Factorize $x^3+13x^2+32x+20$, if it is given that $(x+2)$ is a factor.

Q19 Find the product.

$(3x-5y-4)(9x^2+25y^2+15xy+12x-20y+16)$

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Q20 If $(x+y+z)=0$, Prove that $(x^3+y^3+z^3)=3xyz$

Q21. If $P(x)=2x^3+ax^2+3x-5$ and $q(x)=x^3+x^2-4x+a$ leave the same remainder when divided by $x-2$, show that $a=\frac{-13}{3}$

Q22 Find the value of $(369)^2-(368)^2$

Q23. If $a+b+c=0$ then $\left(\frac{a^2}{bc}+\frac{b^2}{ca}+\frac{c^2}{ab}\right)=?$

Q24. If $\frac{x}{y}+\frac{y}{x}=-1$ where $x\neq 0$ and $y\neq 0$ find the value of (x^3-y^3)

[Ans $x=0$]

Q25 Evaluate $[(28)^3+(-15)^3+(-13)^3]$

Q26 Prove that $(x^3+y^3+z^3-3xyz)=\frac{1}{2}(x+y+z)[(x-y)^2+(y-z)^2+(z-x)^2]$

Q27. If $P=2-a$. Prove that $a^3+6aP+P^3-8=0$

Q28 Find the remainder when $(x^{31}+31)$ is divided by $(x+1)$ [Ans 30]

Q29. If $(a+b+c)=8$ and $(ab+bc+ca)=19$ find $(a^2+b^2+c^2)$

Q30 Find the value of 305×308 by using an identity [Ans 93940]

Q31 If a wheel has six spokes equally spaced then find the measure of the angle between two adjacent spokes

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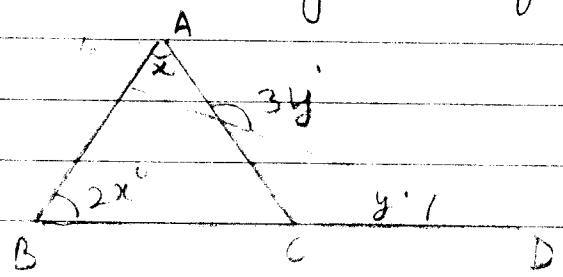
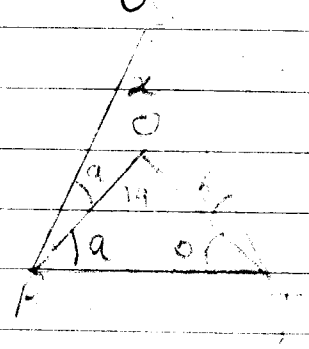
Q32 Two complimentary angles are such two times the measure of one is equal to three times the measure of the other. what is the measure of the smaller angle.

Q33 What is the value of y in terms of x in a given figure

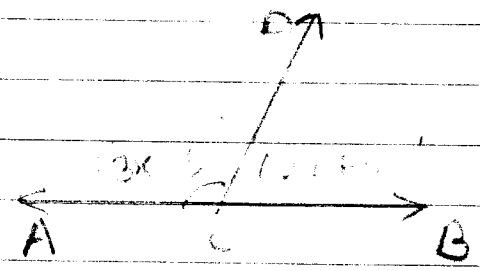


Q34 The base BC of triangle ABC is produced both ways and measure of exterior angles formed are 94° and 126°. what is measure of ∠BAC.

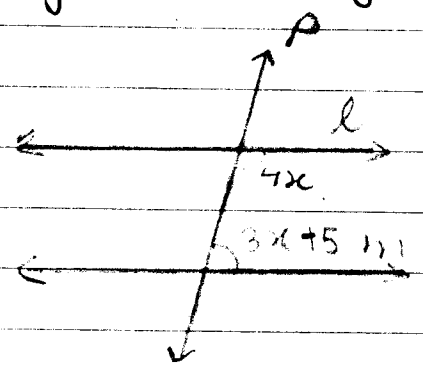
Q35 In the given figure what is the value of x



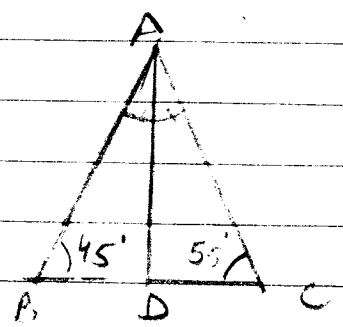
Q36 In the given figure ACB is a straight line and CD is a line segment such that $\angle ACD = (3x-5)^\circ$ and $\angle BCD = (2x+10)^\circ$.



Q37 Find the value of x if $l \parallel m$ in the given figure.



Q38 In ΔABC $\angle B = 45^\circ$, $\angle C = 55^\circ$ and bisector of $\angle A$ meets BC at point D. Find $\angle ADB$ and $\angle ADC$



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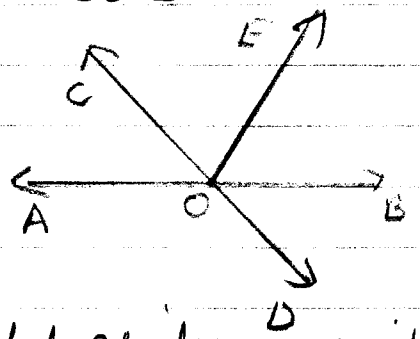
Q39 In a given figure line AB and CD intersect at O. If $\angle AOC + \angle BOE = 70^\circ$ and $\angle BOD = 40^\circ$ find $\angle BOE$ and reflex $\angle COE$

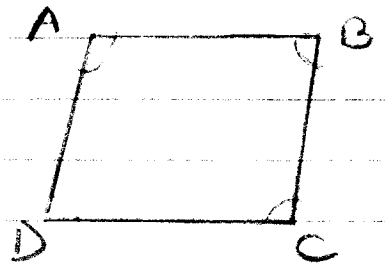


Q40 The opposite sides of a quadrilateral are parallel. If one angle of the quadrilateral is 60°. Find the other angles.

Q41 If $3\angle A = 4\angle B = 6\angle C$. Find $A:B:C$

Q42 In ΔABC, if $\angle A - \angle B = 42^\circ$ and $\angle B - \angle C = 21^\circ$. Find $\angle B$

Q43 In a given figure $AB \parallel DC$ and $AD \parallel BC$. Prove that $\angle DAB = \angle DCB$.



Q44. If two straight lines are perpendicular to the same line, prove that they are parallel to each other.

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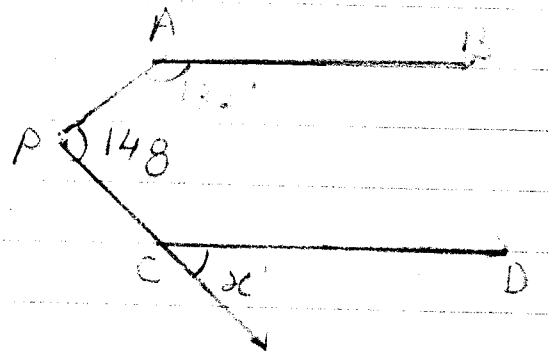
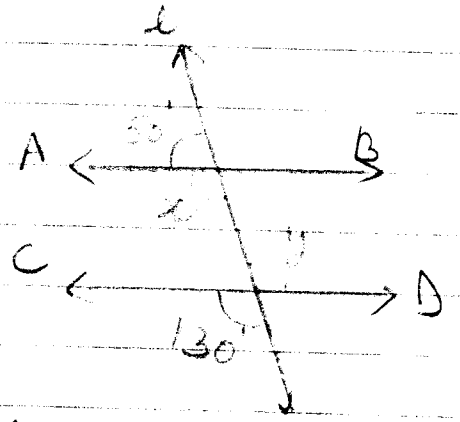
Q45 Two unequal angles of a parallelogram are in the ratio of 2:3. Find all its angles in degrees.

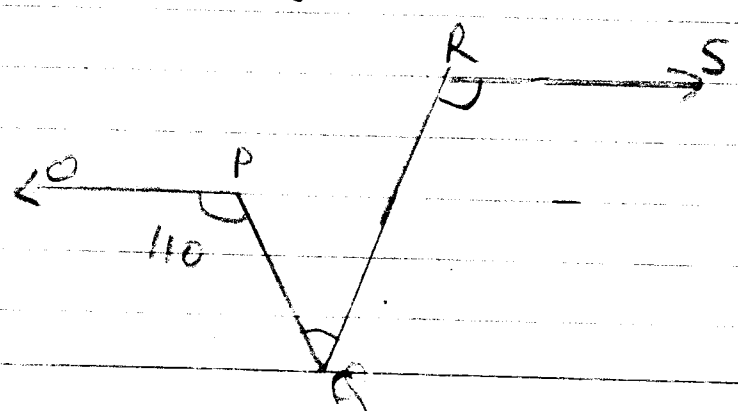
Q46 In a given fig if AB||CD. Find x



Q47 In a given figure find the value of x and y and then show that AB||CD



Q48 In a given figure OP||RS. Determine ∠PQR



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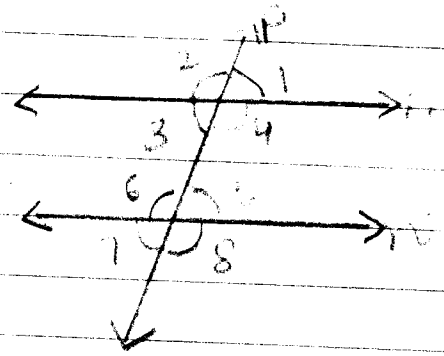
Q49 In a given figure transversal l intersects two lines m and n, $\angle 4 = 110^\circ$ and $\angle 7 = 65^\circ$. Is $m \parallel n$?



Q50. Two lines AB and CD intersect at O. If $\angle AOC + \angle COB + \angle BOD = 270^\circ$ Find the measure of $\angle AOC$, $\angle COB$, $\angle BOD$ and $\angle DOA$