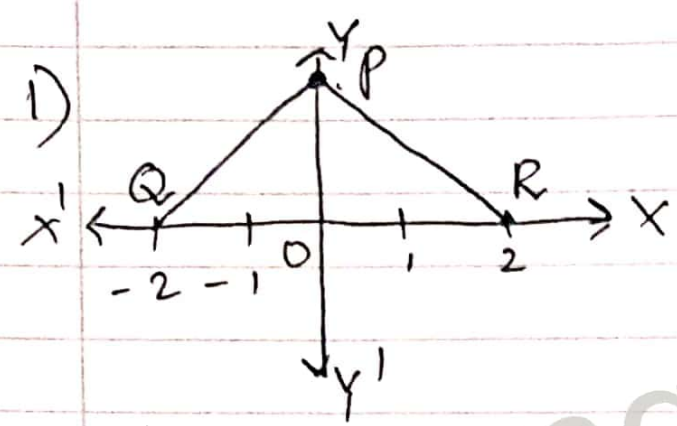
IX Test-7

1) 

PQR is an equilateral Δ with coordinates of Q and R as $(-2,0)$ and $(2,0)$ respectively. find the coordinates of the vertex P.

2) A point both of whose coordinates are negative lie in _____ quadrant.

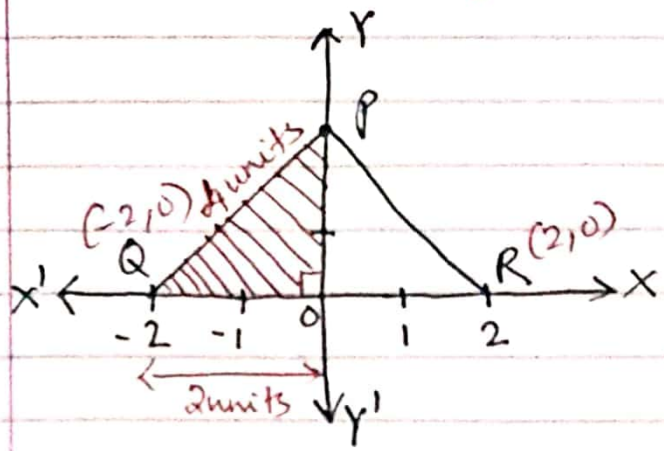
3) Find the value of p^3-q^3, if $p-q = \frac{10}{9}$ and $pq = \frac{5}{3}$

4) If $x^2+\frac{1}{x^2} = 7$, find the value of $x^3+\frac{1}{x^3}$

5) If a, b, c are all non-zero and $a+b+c = 0$, P.T $\frac{a^2}{bc}+\frac{b^2}{ca}+\frac{c^2}{ab}=3$

IX. Test-7 (Answers)

1)



Using Pythagoras Theorem in $\triangle POQ$,

$OP^2 = PQ^2 - OQ^2$

$= 4^2 - 2^2$

$= 16 - 4$

$= 12$

$OP = \sqrt{12} = 2\sqrt{3}$ units

$\therefore$ Coordinates of the vertex P is $(0, 2\sqrt{3})$

2) III quadrant

3) $p^3 - q^3 = (p-q)^3 + 3pq(p-q)$

$= \left(\frac{10}{9}\right)^3 + 3 \times \frac{5}{3} \times \frac{10}{9} = \frac{1000}{729} + \frac{50}{9} \times \frac{81}{81}$

$= \frac{1000 + 4050}{729} = \frac{5050}{729}$

4) $\left(x + \frac{1}{x}\right)^2 = x^2 + \frac{1}{x^2} + 2$

$= 7 + 2 = 9$

$x + \frac{1}{x} = \sqrt{9} = 3$

$\therefore x^3 + \frac{1}{x^3} = \left(x + \frac{1}{x}\right)^3 - 3\left(x + \frac{1}{x}\right)$

$= 3^3 - 3 \times 3 = 27 - 9 = 18$

5) If $a+b+c=0$, then $a^3+b^3+c^3 = 3abc$

LHS, $\frac{a^2}{bc} + \frac{b^2}{ca} + \frac{c^2}{ab} = \frac{a^3+b^3+c^3}{abc} = \frac{3abc}{abc} = 3$, RHS