

Co-Ordinate Geometry - Exercises [HSC]

Q1: Find the (a) gradient (b) length (c) Mid-point of each of the following intervals AB, defined by:

- (i) $A=(2,5)$ $B=(6,3)$ (ii) $A=(5,4)$ $B=(1,-4)$ (iii) $A=(-1,-1)$ $B=(-3,6)$

Q2: Re-arrange to the form $y=mx+b$ (make "y" the subject)

(i) $3x-2y=6$

(ii) $x+3y-6=0$

(iii) $\frac{x}{2}-\frac{y}{3}=5$

Q3: Find the equation of the following lines (in general form):-

(a) thru $(3,-4)$ with gradient $m=2$

(ii) Thru $(-2,5)$ and $(1,-1)$

(iii) Through $(5,1)$ and parallel to $y=5-3x$

ANS: Q1: (i) $m=-\frac{1}{2}$, $l=2\sqrt{5}$, $M=4,4$ (ii) $m=2$, $l=4\sqrt{5}$, $M=(3,0)$
(iii) $m=-\frac{7}{2}$, $l=\sqrt{53}$, $M=(-2,2.5)$

Q2: (i) $y=\frac{3}{2}x-3$ (ii) $y=-\frac{1}{3}x+2$ (iii) $y=\frac{3}{2}x-15$

Q3: (a) $2x-y-10=0$ (b) $2x+y-1=0$ (c) $3x+y-16=0$

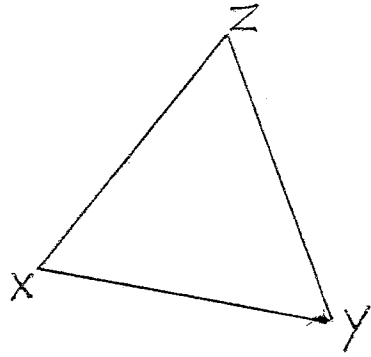
LESSON 32

Quest ①

In a triangle ΔXYZ

$X = (-1, -3)$ $Y = (7, 3)$ $Z = (5, 5)$

- a) Show ΔXYZ is isosceles (2 = sides)
- b) Find the perimeter of the triangle.



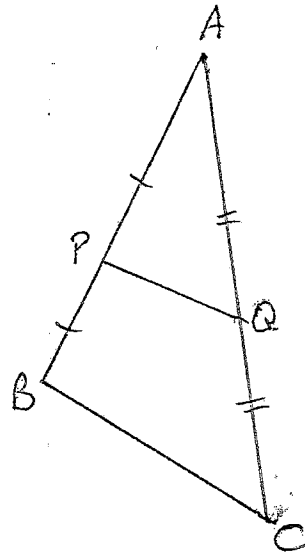
Quest ②

$A = (1, 7)$ $B = (-1, -1)$ $C = (3, -3)$

are the vertices of the $\Delta ABC \rightarrow$

P and Q are the midpoints of AB & AC.

- a) Find the co-ordinates of P & Q
- b) Show that $PQ \parallel BC$



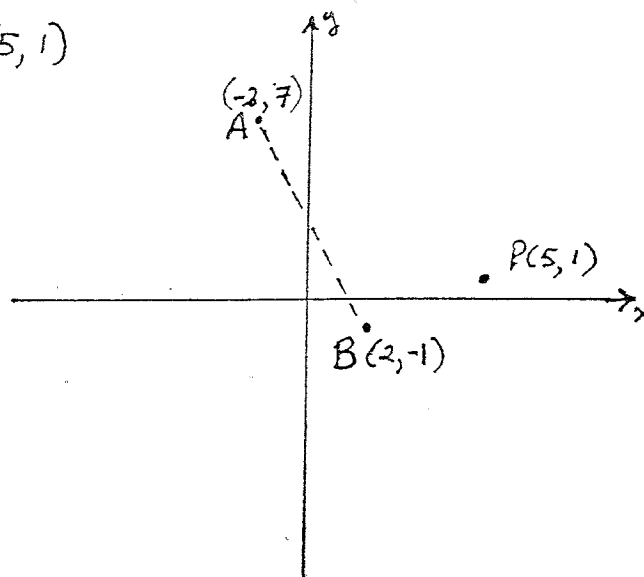
ANSWERS | LESSON 32 / 33

- ① $XY = 10$ $XZ = 10$ $YZ = \sqrt{8}$ $Per = 22.83$ ② $P = (0, 3)$ $Q = (2, 2)$ $m_{PQ} = -\frac{1}{2}$ $m_{BC} = -\frac{1}{2}$
- ③ (a) $m = -2 \therefore y = -2x + 3$ (b) $m = -2 \therefore y = -2x + 11$ (c) $m = \frac{1}{2}$ $y = \frac{x}{2} - 1\frac{1}{2}$ (d) $(0, 3)$ $m = \frac{1}{2} \therefore y = \frac{x}{2} + 3$
- ④ (a) $M = (2, 0)$ $R = (3, 3)$ $m = 3 \therefore y = 3x - 6$ (b) $x = 3$ (c) $Area = \frac{1}{2} \times 6 \times 3 = 9 \text{ units}^2$

LESSON 32 - HW

Qu 3: If $A = (-2, 7)$ $B = (2, -1)$ and $P = (5, 1)$

(a) Find equation of line through A B



(b) Find equation of line through P , and parallel to AB

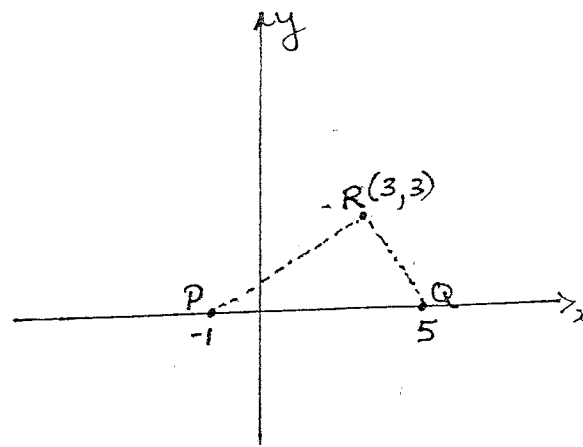
(c) Find the equation of the line through P and perpendicular to AB

(d) Find the equation of the line through the Mid-point of AB and perpendicular to AB .

Qu 4: P, Q , and R form a triangle.

with $P = (-1, 0)$ $Q = (5, 0)$ and $R = (3, 3)$

Find: (a) The equation of the "median" from R to the side PQ



(c) The area of the $\triangle PQR$

* (b) The equation of the "altitude" from R to the side PQ

LESSON 37 - HW

Qu 1:

Find the equation of the lines:-

a) Passing through $(5, -1)$ making 120° with the positive x -axis.

$\frac{1}{2}$

b) Through the intersection of $3x - y = 9$ and $x + 2y = -4$ and parallel to the line $3x - 2y = 6$

Qu 2: (a) Find "p" if $x - py = 5$ passes through the point $(4, -4)$

(b) Show that $3x - y = 1$ and $2x + 6y = 5$ and $x + y = 3$ form a right angle triangle.

Qu 3:

Find the perpendicular distance of the point $(2, -5)$ from the line $3x - 4y + 4 = 0$

ANSWERS

(1) (a) $m = -\sqrt{3}$ (-0.577) eqn: $y = -0.577x + 3.33$ (b) $m = \frac{2}{3}$ (0.667) eqn: $y = 0.667x - 2.33$ (c) $d = \frac{|3(2) - 4(-5) + 4|}{\sqrt{3^2 + 4^2}} = \frac{|6 + 20 + 4|}{5} = 6$ units.

LESSON 35 - HW

Quest ①:

(a) Find the perpendicular distance from $x - y - 1 = 0$ of the points:
(i) $(8, 6)$ (ii) $(4, -2)$ (iii) $(1, 0)$

(b) What is the closest the line $3x - 4y + 5 = 0$ comes to the Origin?

Quest ②:

(a) If the line: $kx - 2y = k$ passes through the point $(3, -4)$, find the value of k .

(b) A function is an "EVEN" function if $f(-x) = f(x)$ for all values of x .
Is $f(x) = 5 - 2x^2$ even? Show why / why not.

Quest ③:

The ΔABC has vertices $A(2, 3)$ $B(5, 7)$ and $C(-3, 4)$

Find: (i) the length of interval AB

(ii) the equation of line AB in general form

(iii) the perpendicular distance of point C from AB.

(iv) Use the above to find the area of ΔABC .

ANSWERS

(1) $\frac{1}{\sqrt{2}}$ (2) $\frac{3\sqrt{2}}{2}$ (3) 0 (4) limit. (5) (a) $k = -4$ (b) $\frac{1}{2} \sqrt{5-2x^2} = 5-2x^2$
(6) $\frac{1}{2} \sqrt{5-2x^2} = 5-2x^2$ (7) $\frac{1}{2} \sqrt{5-2x^2} = 5-2x^2$ (8) $\frac{1}{2} \sqrt{5-2x^2} = 5-2x^2$
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