

## coordinate geometry

$$1) P(2,3)$$

$$b) 3$$

$$2) P(1,4) \quad Q(4,0)$$

$$\sqrt{(4-1)^2 + (0-4)^2}$$

$$= \sqrt{3^2 + (-4)^2}$$

$$= \sqrt{25} = 5 \quad (b)$$

$$3) A(-5,1), \quad B(1,p), \quad C(4,-2)$$

$$x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2) = 0$$

$$= -5(p+2) + 1(-2-1) + 4(1-p) = 0$$

$$\Rightarrow (-5p - 10 - 3 + 4 - 4p) = 0$$

$$\Rightarrow -9p = -9$$

$$p = 1 \quad (d)$$

$$4) A(a+b, a-b) \quad B(a-b, -a-b)$$

$$\sqrt{((a-b)-(a+b))^2 + ((-a-b)-(a-b))^2}$$

$$= \sqrt{(a-b-a-b)^2 + (-a-b-a+b)^2}$$

$$= \sqrt{4b^2 + 4a^2} = 2\sqrt{a^2 + b^2} \text{ units}$$

$$5) A(x, -1), B(3, 2) \quad \text{distance} = 5$$

$$\sqrt{(3-x)^2 + (2+1)^2} = 5$$

$$\sqrt{9+x^2-6x+4+1+4} = 5$$

$$\sqrt{x^2-6x+18} = 5$$

$$= x^2-6x+18 = 25$$

$$= x^2-6x-7 = 0$$

$$= x^2-7x+x-7 = 0$$

$$x(x-7) + 1(x-7)$$

$$x = 7, -1 \text{ (d)}$$

$$6) (1, 1), (-2, 7), (3, -3)$$

b) collinear

$$7) A(1, 2), B(0, 0), C(a, b)$$

$$x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2)$$

$$= 1(0 - b) + 0(a - 1) + a(2 - 0) = 0$$

$$\Rightarrow -b + 2a = 0$$

$$\Rightarrow 2a = b \quad (a)$$

$$8) A(2, 3), B(4, k), C(6, -3)$$

$$x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2) = 0$$

$$2(k - (-3)) + 4(-3 - 3) + 6(3 - k) = 0$$

$$= 2k + 6 - 24 + 18 - 6k = 0$$

$$\Rightarrow -4k = 0$$

$$k = 0.$$



SHOT ON POCO X3

$$a) (-3, 4)$$

$$\sqrt{x^2 + y^2}$$

$$= \sqrt{9 + 16}$$

$$= 5 \text{ units}$$

(A)

$$10) A(1, 2), B(-2, 3) \text{ \& } C(-3, -4)$$

$$AB = \sqrt{(-2-1)^2 + (3-2)^2} = \sqrt{9+1} = \sqrt{10}$$

$$BC = \sqrt{(-3+2)^2 + (-4-3)^2} = \sqrt{1+49} = \sqrt{50}$$

$$CA = \sqrt{(1+3)^2 + (2+4)^2} = \sqrt{16+36} = \sqrt{52}$$