Mathematics 10D

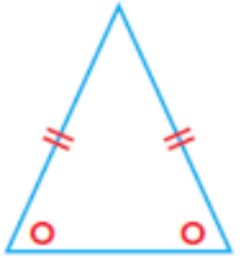
2.4 – Classifying Figures on a Coordinate Grid

Mr. D. Hagen

pg 101

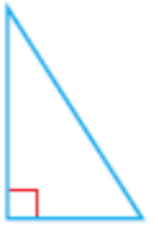
Triangles

equilateral triangle

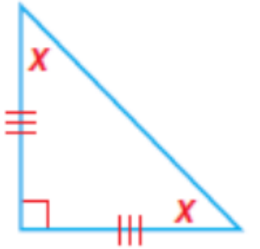


isosceles triangle

scalene triangle

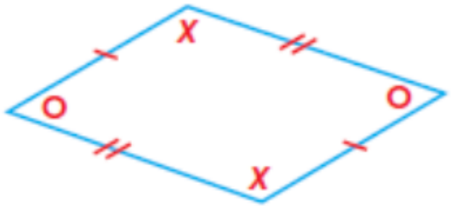


right triangle

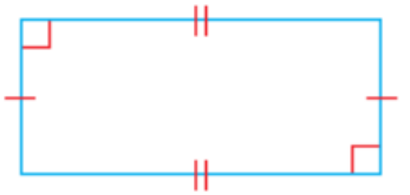


isosceles right triangle

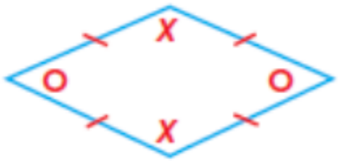
Quadrilaterals



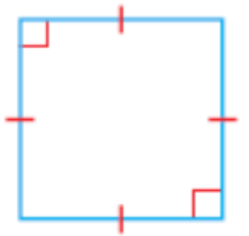
parallelogram



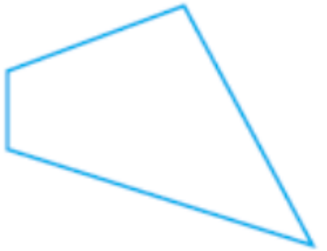
rectangle



rhombus

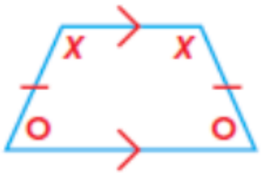


square

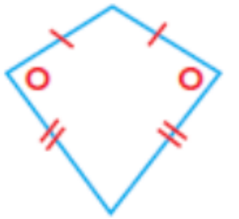


irregular quadrilateral

trapezoid



isosceles trapezoid



kite

A surveyor has marked the corners of a lot where a building is going to be constructed. The corners have coordinates $P(-5,-5)$, $Q(-30, 10)$, $R(-5, 25)$, and $S(20, 10)$. Each unit represents 1 m. The builder wants to know the perimeter and shape of this building lot.

$d_{PQ} = PQ$

$d_{PQ} = \sqrt{(-30+5)^2 + (10+5)^2} = \sqrt{625 + 225} = \sqrt{850} = 29.2$

($x_2 - x_1$, $y_2 - y_1$)

$d_{QR} = \sqrt{(-5+30)^2 + (25-10)^2} = \sqrt{625 + 225} = \sqrt{850} = 29.2$

$d_{RS} = \sqrt{(20+5)^2 + (10-25)^2} = \sqrt{625 + 225} = \sqrt{850} = 29.2$

$d_{SP} = \sqrt{(20+5)^2 + (10+5)^2} = \sqrt{625 + 225} = \sqrt{850} = 29.2$

$$m_{PQ} = \frac{10+5}{30+5} = \frac{15}{25} = -\frac{3}{5}$$

$$m_{QR} = \frac{25-10}{-5+30} = \frac{15}{25} = \frac{3}{5}$$

$$m_{RS} = \frac{10-25}{20+5} = \frac{-15}{25} = \frac{-3}{5}$$

$$m_{SP} = \frac{10+5}{20+5} = \frac{15}{25} = \frac{3}{5}$$

$\therefore$ PQRS is a rhombus

A triangle has vertices at $A(-1, -1)$, $B(2, 0)$, and $C(1, 3)$. What type of triangle is it?

$$d_{AB} = \sqrt{(2+1)^2 + (0+1)^2} = \sqrt{9+1} = \sqrt{10} \Rightarrow a^2 = 10$$

$$d_{BC} = \sqrt{(1-2)^2 + (3-0)^2} = \sqrt{1+9} = \sqrt{10} \Rightarrow b^2 = 10$$

$$d_{CA} = \sqrt{(-1-1)^2 + (-1-3)^2} = \sqrt{4+16} = \sqrt{20} \quad c^2 = 20$$

$$m_{AB} = \frac{0+1}{2+1} = \frac{1}{3} \quad \frac{-3}{1} \qquad m_{BC} = \frac{3-0}{1-2} = \frac{3}{-1} = -3$$

$\therefore$ Isosceles right triangle.