

Equidistant

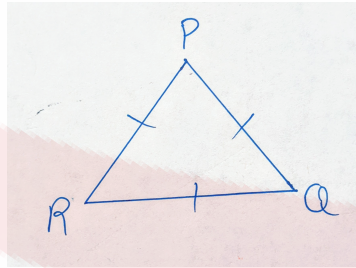
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2020

Equidistant

Equidistant means all objects are the same distance from all other objects in a set of objects. For example, if we have three points P, Q and R , if they are all the same distance apart from one another, then they are equidistant from one another.



Example

Are the following points equidistant? $A=(2, -4), B=(6, -5), C = (5, -2)$?

Solution We need to show the distances between all pairs of points are equal or at least two distances are unequal to show *not* equidistant. We need to use the distance formula.

$$\begin{aligned}
 AB &= \sqrt{(6-2)^2 + (-5+4)^2} \\
 &= \sqrt{4^2 + 1^2} \\
 &= \sqrt{16+1} \\
 &= \sqrt{17} \\
 AC &= \sqrt{(5-2)^2 + (-2+4)^2} \\
 &= \sqrt{3^2 + 2^2} \\
 &= \sqrt{9+4} \\
 &= \sqrt{13} \\
 &\neq \sqrt{17} = AB
 \end{aligned}$$

Therefore, the 3 points are *not* equidistant.

Exercises

Determine whether the following points, P , Q and R , are equidistant.

a) $P(3, 2), Q(0, 2), R(-3, 1)$

g) $P(4, 0), Q(-1, 2), R(1, 1)$

b) $P(4, 1), Q(-1, 0), R(0, 4)$

h) $P(-1, -2), Q(4, 3), R(3, 1)$

c) $P(-1, 2), Q(2, 0), R(-1, 3)$

i) $P(-3, -4), Q(2, 0), R(5, 4)$

d) $P(3, -2), Q(2, 2), R(-1, 2)$

j) $P(0, -4), Q(3, 0), R(-2, 3)$

e) $P(-5, 3), Q(0, 1), R(5, 4)$

k) $P(-2, 5), Q(2, 2), R(1, 3)$

f) $P(-2, 0), Q(1, 3), R(4, -1)$