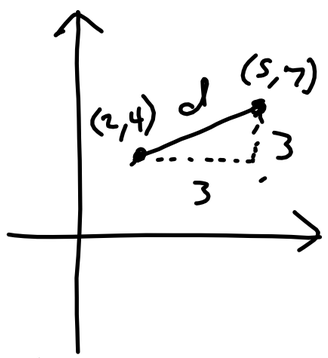
Polygons in Coordinate Plane

- Distance

EX → A(5,7), B(2,4)



$d = \sqrt{3^2 + 3^2}$

$d = \sqrt{9+9} = \sqrt{18}$

$d = \sqrt{9} \cdot \sqrt{2} = 3\sqrt{2}$

EX → A(4,7), B(-2,5)

6, 2

$d = \sqrt{6^2 + 2^2}$

$d = \sqrt{36+4} = \sqrt{40}$

$d = \sqrt{4} \cdot \sqrt{10} = 2\sqrt{10}$

EX → A(2,-3), B(6,-5)

4, 2

$d = \sqrt{4^2 + 2^2}$

$d = \sqrt{16+4} = \sqrt{20}$

$d = \sqrt{4} \cdot \sqrt{5} = 2\sqrt{5}$

EX → A(3,-9), B(-9,3)

12, 12

$d = \sqrt{12^2 + 12^2}$

$d = \sqrt{144+144} = \sqrt{288}$

$d = \sqrt{144} \cdot \sqrt{2} = 12\sqrt{2}$

- Midpoint

$$M\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$$

Ex → $(-6,5), (5,6)$

$$\frac{-6+5}{2}, \frac{5+6}{2}$$

$$\left(\frac{-1}{2}, \frac{11}{2}\right)$$

Ex → $(-10,9), (4,7)$

$$\frac{-10+4}{2}, \frac{9+7}{2}$$

$$\frac{-6}{2}, \frac{16}{2}$$

$$(-3,8)$$

Ex → $(3,-9), (4,-8)$

$$\frac{3+4}{2}, \frac{-9+-8}{2}$$

$$\left(\frac{7}{2}, \frac{-17}{2}\right)$$

Ex → $(5,7), (11,-6)$

$$\frac{5+11}{2}, \frac{7+-6}{2}$$

$$\frac{16}{2}, \frac{1}{2}$$

$$\left(8, \frac{1}{2}\right)$$

- Slope

$m = \frac{y_2 - y_1}{x_2 - x_1}$ / $\perp$ slopes are "flopposites"

EX → A(3, 1), B(5, 7)

$m = \frac{7-1}{5-3} = \frac{6}{2} = 3$

C(1, 1), D(-2, 4)

$m = \frac{4-1}{-2-1} = \frac{3}{-3} = -1$

EX → A(1, 2), B(3, 6)

$m = \frac{6-2}{3-1} = \frac{4}{2} = \frac{2}{1}$

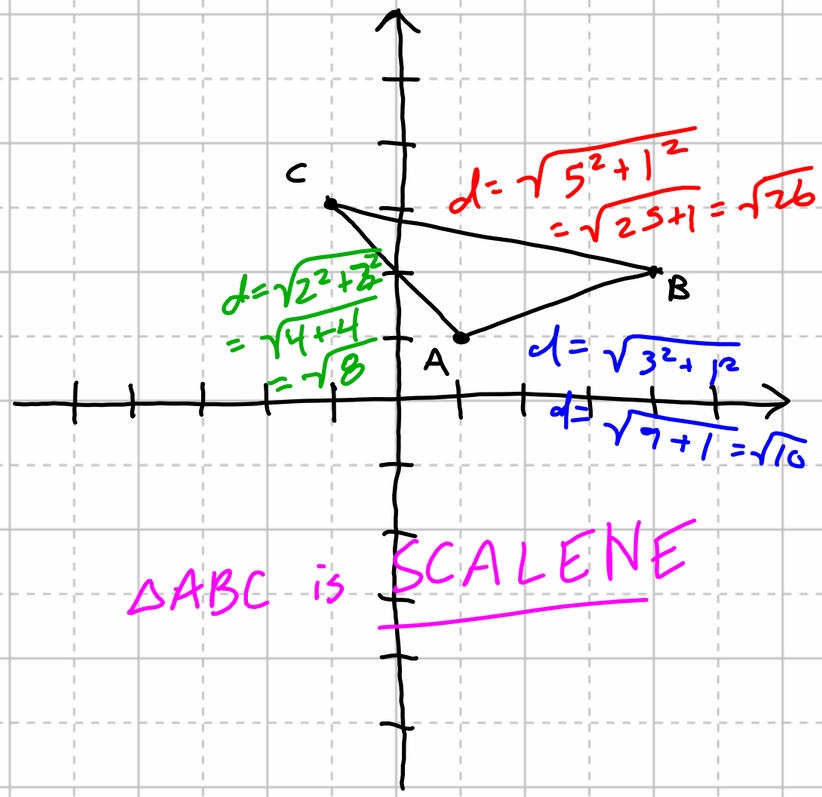
C(5, 4), D(9, 2)

$m = \frac{2-4}{9-5} = \frac{-2}{4} = -\frac{1}{2}$

FLOPPOSITES → $\perp$

EX → What type of triangle is formed by the following coordinates?

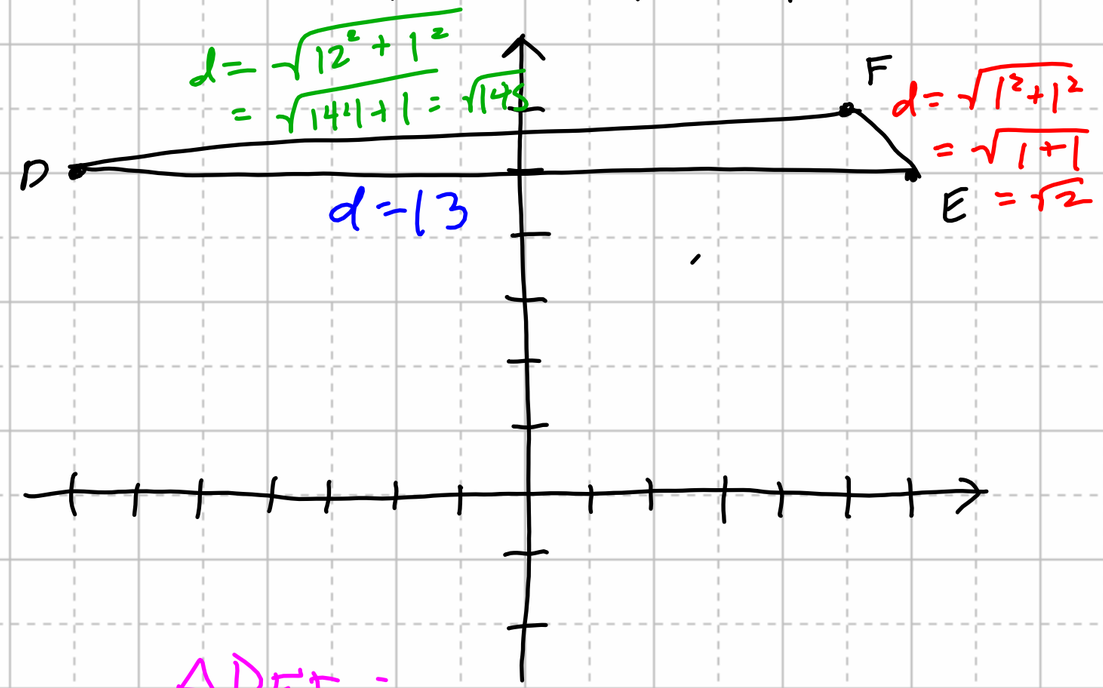
A(1,1), B(4,2), C(-1,3)



$\triangle ABC$ is SCALENE

EX → What type of triangle is formed by the following coordinates?

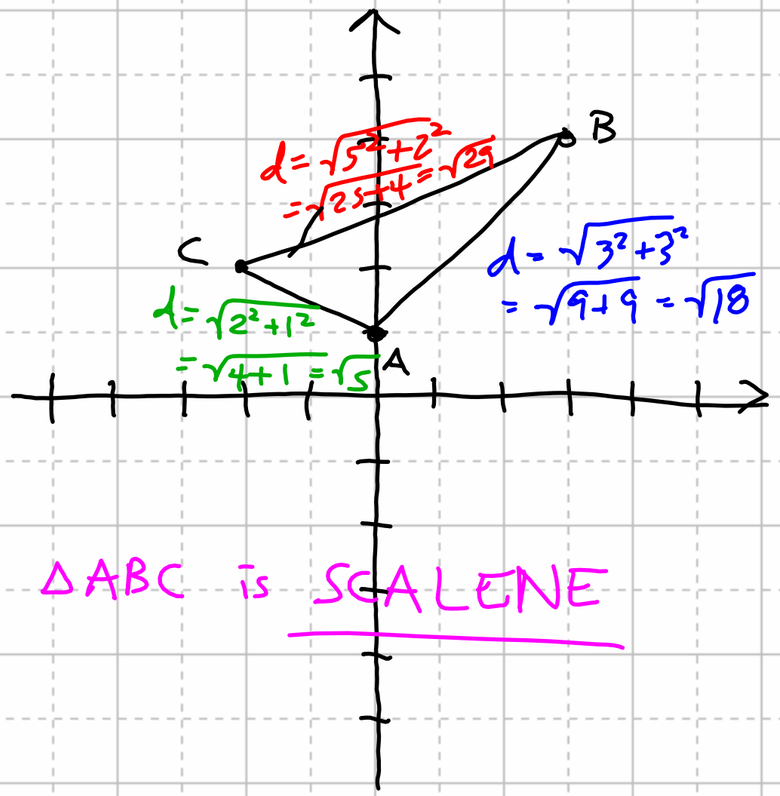
D(-7,5), E(6,5), F(5,6)



$\triangle DEF$ is SCALENE

EX → What type of triangle is formed by the following points?

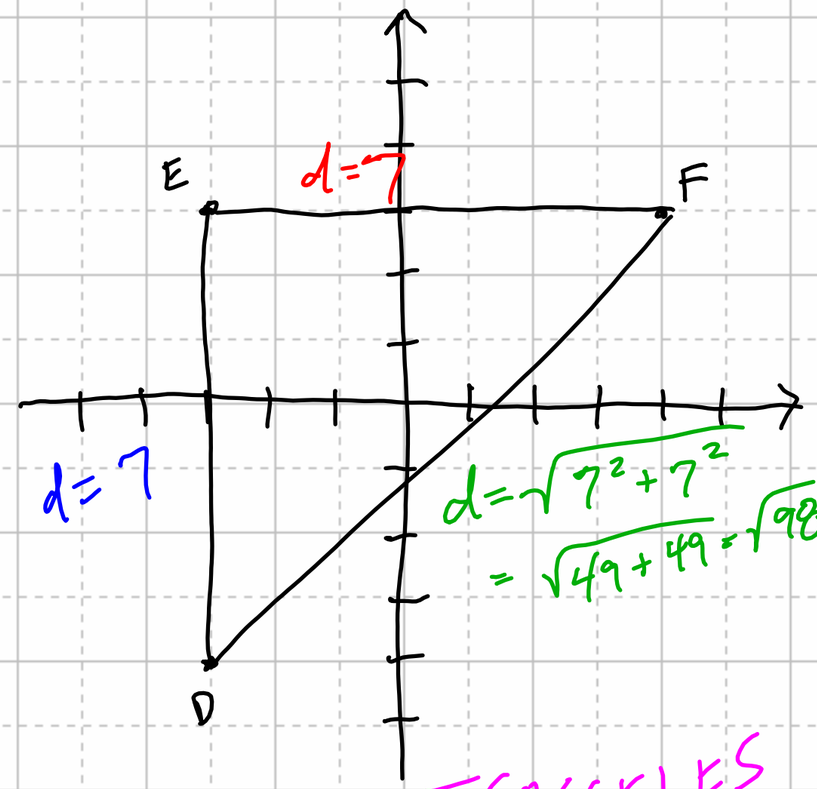
A(0,1), B(3,4), C(-2,2)



$\triangle ABC$ is SCALENE

EX → What type of triangle is formed by the following points?

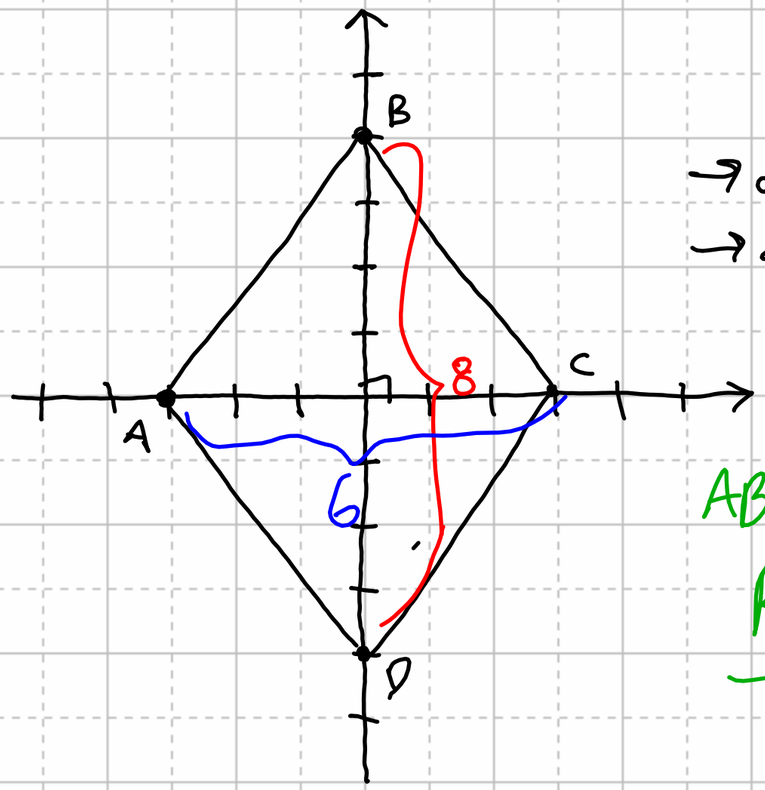
D(-3,-4), E(-3,3), F(4,3)



$\triangle DEF$ is ISOSCELES

EX → What type of quadrilateral is formed by the following points?

A(-3,0), B(0,4), C(3,0), D(0,-4)



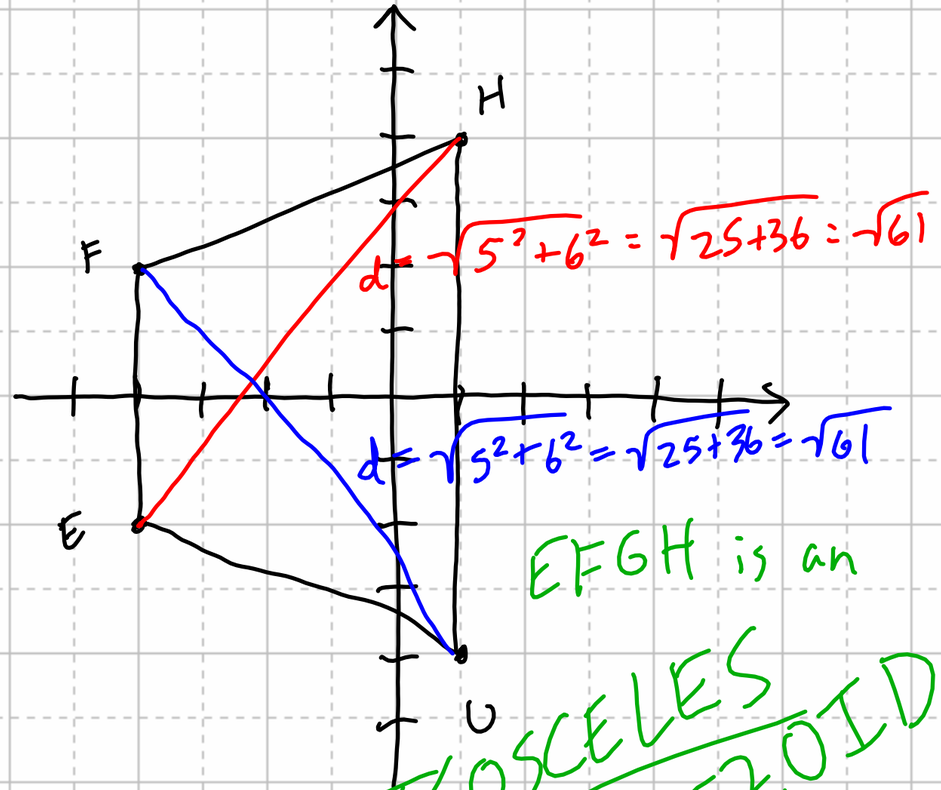
→ diagonals are ⊥

→ diagonals are ≠

ABCD is a RHOMBUS

EX → What type of quadrilateral is formed by the following points?

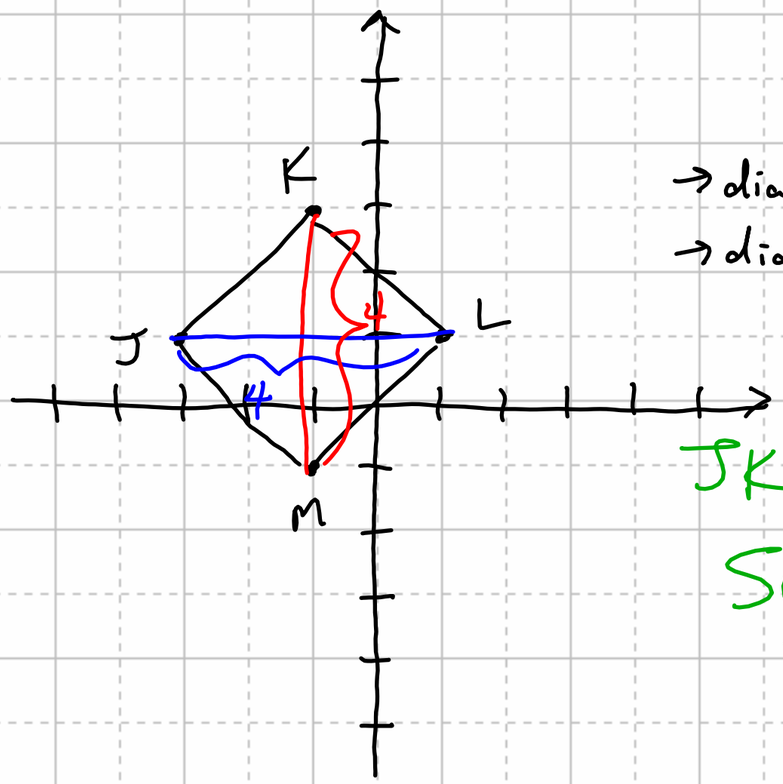
E(-4,-2), F(-4,2), G(1,-4), H(1,4)



EFGH is an ISOSCELES TRAPEZOID

EX » What type of quadrilateral is formed by the following points?

J(-3, 1), K(-1, 3), L(1, 1), M(-1, -1)



→ diagonals are ≅

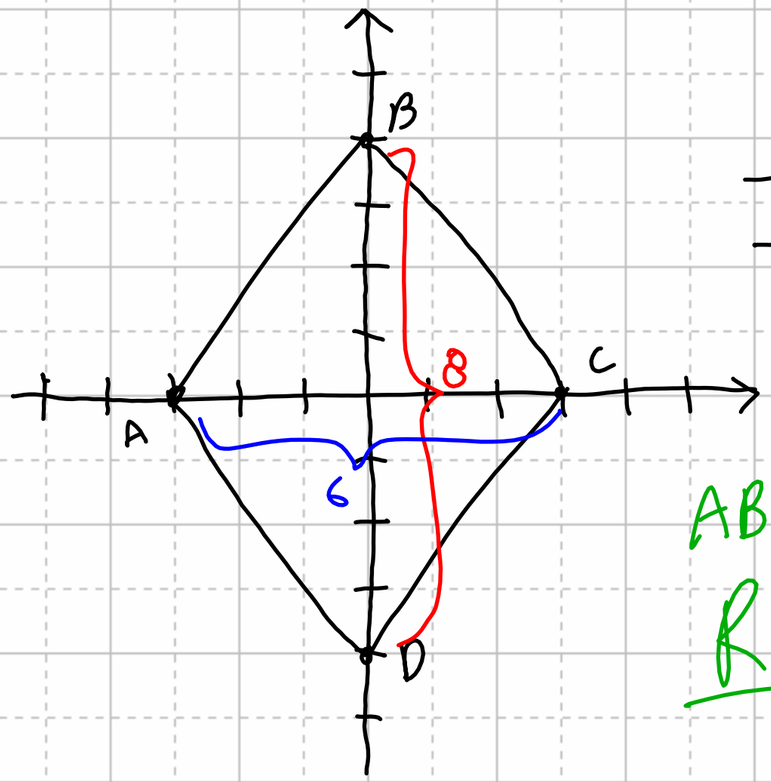
→ diagonals are ⊥

↓

JKLM is a SQUARE

EX → What type of quadrilateral is formed by the following points?

A(-3,0), B(0,4), C(3,0), D(0,-4)



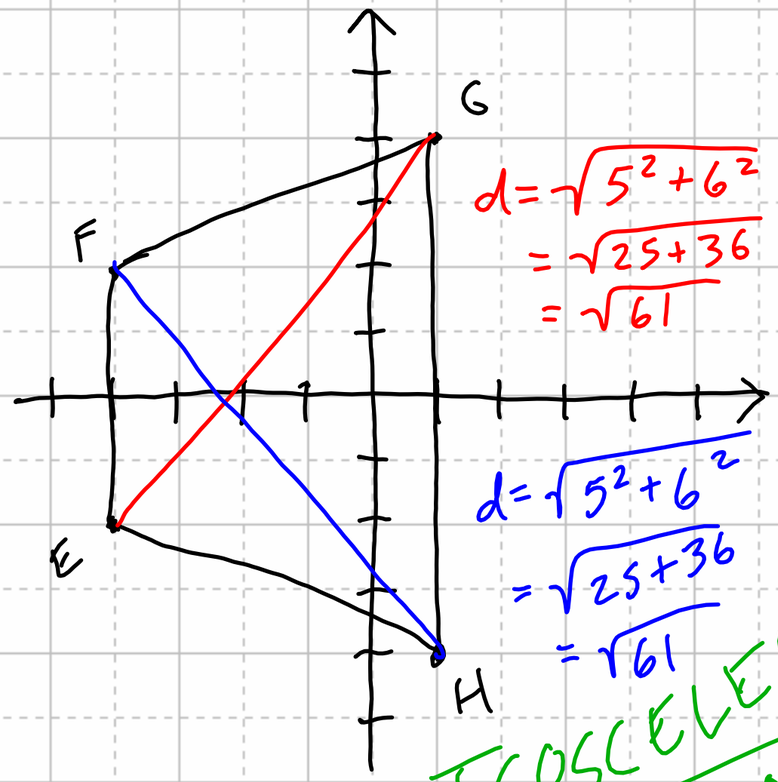
→ diagonals are ⊥

→ diagonals are ≠

ABCD is a RHOMBUS

EX → What type of quadrilateral is formed by the following points?

E(-4,-2), F(-4,2), G(1,4), H(1,-4)



$d = \sqrt{5^2+6^2}$

$= \sqrt{25+36}$

$= \sqrt{61}$

$d = \sqrt{5^2+6^2}$

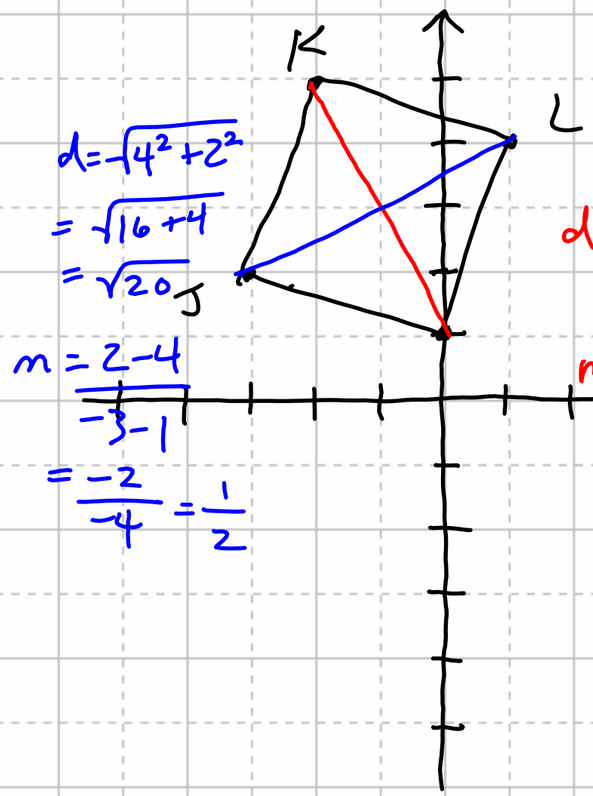
$= \sqrt{25+36}$

$= \sqrt{61}$

EFGH is an ISOSCELES TRAPEZOID

EX → What type of quadrilateral is formed by the following coordinates?

J(-3, 2), K(-2, 5), L(1, 4), M(0, 1)



$d = \sqrt{4^2 + 2^2}$

$= \sqrt{16+4}$

$= \sqrt{20}$

$m = \frac{2-4}{-3-1}$

$= \frac{-2}{-4} = \frac{1}{2}$

$d = \sqrt{2^2 + 4^2} = \sqrt{4+16}$

$= \sqrt{20}$

$m = \frac{5-1}{-2-0} = \frac{4}{-2} = -2$

→ diagonals are ≅

→ diagonals are ⊥

↓

JKLM is a SQUARE

HW: p. 403 → 5-7, 17-20

HW : p. 403 → 8-32 mult. 4, 45-47