Name: Kelly

UNIT 7

Date: _____

REVIEW

COORDINATE GEOMETRY REVIEW!

	DISTANCE	SLOPE	MIDPOINT	DIRECTED LINE SEGMENTS
FORMULA	$\sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$	$\frac{y_2-y_1}{x_2-x_1}$	$\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$	$(x_1+k(x_2-x_1), y_1+k(y_2-y_1))$
KEY WORDS	• **CONGRUENT** • **EQUAL** • **CONGRUENT DIAGONALS**	• **PARALLEL** *(same slope)* • **PERPENDICULAR** *(negative reciprocal slope)* • **RIGHT ANGLES** *(perpendicular lines have negative reciprocal slopes)*	• **BISECT** • **INTERSECTION OF DIAGONALS**	• $k = \frac{1st\ number\ of\ ratio}{sum\ of\ ratio}$ • **RATIO!**

1) Answer the following questions (a-e) by circling (T)rue or (F)alse:

a) The diagonals of a square bisect each other — **T or F**

b) Diagonals of a square do not bisect its angles. yes, they do! — **T or F**

c) One way to prove a parallelogram is to show that one Pair of opposite sides are both congruent and parallel — **T or F**

d) The only formula needed to prove a trapezoid is the ~~Midpoint~~ formula — **T or F**

super.

e) The diagonals of a rectangle, rhombus, and square form Perpendicular lines — **T or F**

Not rectangle

2) What are the coordinates of point C on the directed segment from $A(-8,4)$ to $B(10,-2)$ that partitions the segment such that $AC:CB$ is 2:1? $K=\frac{2}{3}$

1) $(1,1)$ 2) $(-2,2)$ 3) $(2,-2)$ 4) $(4,0)$

$\left(-8+\frac{2}{3}(10-8), 4+\frac{2}{3}(-2-4)\right)$

$(4,0)$

3) The coordinates of the endpoints of $\overline{QS}$ are $Q(-9,8)$ and $S(9,-4)$. Point R is on $\overline{QS}$ such that $QR:RS$ is in the ratio of 1:2. What are the coordinates of point R?

$K=1/3$

1) $(0,2)$ 2) $(3,0)$ 3) $(-3,4)$ 4) $(-6,6)$

$\left(-9+\frac{1}{3}(9-9), 8+\frac{1}{3}(-4-8)\right)$

$(-3,4)$

4) The lines represented by the equations $y + \frac{1}{2}x = 4$ and $3x + 6y = 12$ are

1) the same line
2) parallel
3) perpendicular
4) neither parallel nor perpendicular

$-\frac{1}{2}x \quad -\frac{1}{2}x \quad -3x \quad -3x$

$y = -\frac{1}{2}x + 4 \qquad \frac{6y}{6} = \frac{-3x}{6} + \frac{12}{6}$

same slope = parallel!! $\qquad y = -\frac{1}{2}x + 2$

5) The lines $3y + 1 = 6x + 4$ and $2y + 1 = x - 9$ are

$-1 \quad -1 \qquad -1 \quad -1$

$\frac{3y}{3} = \frac{6x}{3} + \frac{3}{3} \qquad \frac{2y}{2} = \frac{x}{2} - \frac{10}{2}$

$y = 2x + 1 \qquad y = \frac{1}{2}x - 5$

1) parallel
2) perpendicular
3) the same line
4) neither parallel nor perpendicular

Has to be OPPOSITE reciprocal slopes! sign must change to be 1!

6) The coordinates of the vertices of parallelogram *CDEH* are $C(-5, 5)$, $D(2, 5)$, $E(-1, -1)$, and $H(-8, -1)$. What are the coordinates of *P*, the point of intersection of diagonals $\overline{CE}$ and $\overline{DH}$?

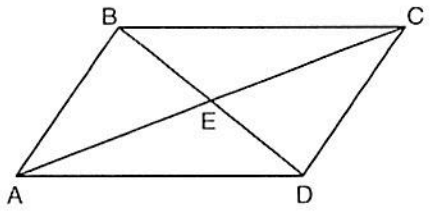
midpoint! of $\overline{CE}$ or $\overline{DH}$

1) $(-2, 3)$
2) $(-2, 2)$
3) $(-3, 2)$
4) $(-3, -2)$

$\overline{CE} = \left(\frac{-5 + -1}{2}, \frac{5 + -1}{2}\right) = (-3, 2)$

7) In the diagram below, parallelogram *ABCD* has vertices $A(1, 3)$, $B(5, 7)$, $C(10, 7)$, and $D(6, 3)$. Diagonals $\overline{AC}$ and $\overline{BD}$ intersect at *E*.

MIDPOINT! of AC or BD



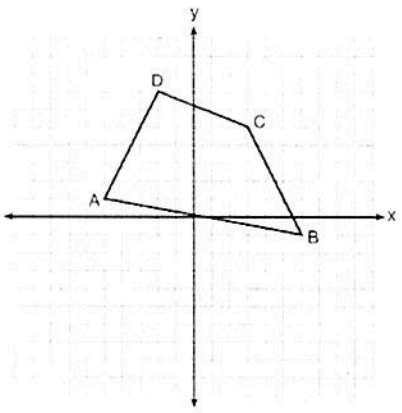
(Not drawn to scale)

What are the coordinates of point *E*?

1) $(0.5, 2)$
2) $(4.5, 2)$
3) $(5.5, 5)$
4) $(7.5, 7)$

$\overline{AC} = \left(\frac{1 + 10}{2}, \frac{3 + 7}{2}\right) = (5.5, 5)$

8) In the diagram below, quadrilateral *ABCD* has vertices $A(-5,1)$, $B(6,-1)$, $C(3,5)$, and $D(-2,7)$.



What are the coordinates of the midpoint of diagonal $\overline{AC}$?

1) $(-1,3)$
2) $(1,3)$
3) $(1,4)$
4) $(2,3)$

$\overline{AC} = \left(\frac{-5+3}{2}, \frac{1+5}{2}\right) = (-1,3)$

9) The coordinates of *A* and *C* in rhombus *ABCD* are $A(8,2)$ and $C(0,6)$. What is the equation of diagonal *BD*?

1) $y = 2x - 4$
2) $y = -\frac{1}{2}x + 2$
3) $y = -\frac{1}{2}x + 6$
4) $y = 2x - 12$

step 1: ⊥ slope $\frac{6-2}{0-8} = \frac{4}{-8} = -\frac{1}{2}$ $\perp m = 2$ ⊥ bisector!

step 2: midpoint $\left(\frac{8+0}{2}, \frac{2+6}{2}\right) = (4,4)$ (x_1 y_1)

step 3: point slope $y - 4 = 2(x-4)$

$y - 4 = 2x - 8$

$+4 \quad +4$

$y = 2x - 4$

10) Square *MANY* has coordinates *M*(-11, 5) and *N*(5, -7). What is the equation of diagonal *AY*?

1) $y + 1 = \frac{4}{3}(x+3)$
2) $y + 1 = -\frac{3}{4}(x+3)$
3) $y - 6 = \frac{4}{3}(x-8)$
4) $y - 6 = -\frac{3}{4}(x-8)$

⊥ bisector!

step 1: ⊥ slope $\frac{-7-5}{5-11} = \frac{-12}{16} = -\frac{3}{4}$ $\perp m = \frac{4}{3}$

step 2: midpoint $\left(\frac{-11+5}{2}, \frac{5+-7}{2}\right) = (-3,-1)$ (x_1 y_1)

step 3: point slope $y - -1 = \frac{4}{3}(x - -3)$

$y + 1 = \frac{4}{3}(x+3)$

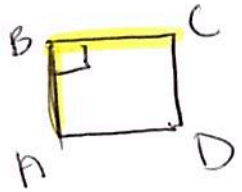
$y + 1 = \frac{4}{3}x + 4$

$-1 \quad -1$

$y = \frac{4}{3}x + 3$

oops, not needed!

11) The coordinates of two vertices of square *ABCD* are $A(2,1)$ and $B(4,4)$. Determine the slope of side $\overline{BC}$.

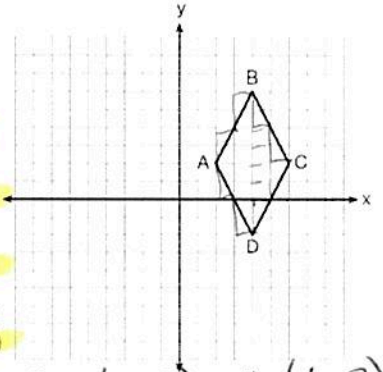


$AB \perp BC \rightarrow$ opp. recip. slope!

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

12) Quadrilateral *ABCD* is graphed on the set of axes below.
Which quadrilateral best classifies *ABCD*?

1) trapezoid
2) rectangle → no right 4's
3) rhombus
4) square → no right 4's



$\overline{AB} = \sqrt{(4-2)^2+(6-2)^2} = \sqrt{20}$
$\overline{BC} = \sqrt{(6-4)^2+(2-6)^2} = \sqrt{20}$
$\overline{CD} = \sqrt{(4-6)^2+(-2-2)^2} = \sqrt{20}$
$\overline{AD} = \sqrt{(4-2)^2+(-2-2)^2} = \sqrt{20}$

All sides are = RHOMBUS!

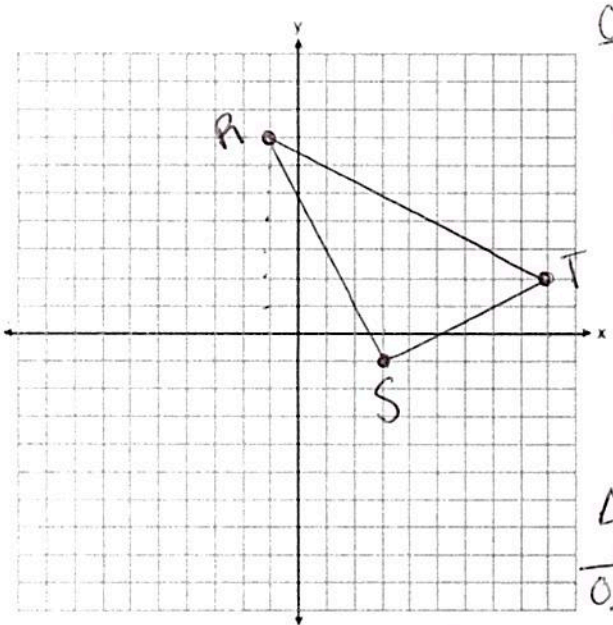
$A=(2,2)$ $C=(6,2)$
$B=(4,6)$ $D=(4,-2)$

12) Triangle *ABC* has vertices $A(0,0)$, $B(3,2)$, and $C(0,4)$. The triangle may be classified as

1) equilateral 2) isosceles 3) right 4) scalene

$\overline{AB} = \sqrt{(3-0)^2+(2-0)^2} = \sqrt{13}$
$\overline{BC} = \sqrt{(0-3)^2+(4-2)^2} = \sqrt{13}$
$\overline{AC} = \sqrt{(0-0)^2+(4-0)^2} = \sqrt{16}$
2 ≅ sides!

13) Given: Triangle *RST* has coordinates $R(-1,7)$, $S(3,-1)$, and $T(9,2)$
Prove: $\triangle RST$ is a right triangle
[The use of the set of axes below is optional.]



OPTION 1: 3 Distance → $a^2+b^2=c^2$

$\overline{RS} = \sqrt{(3-1)^2+(-1-7)^2} = \sqrt{80}$
$\overline{ST} = \sqrt{(9-3)^2+(2-1)^2} = \sqrt{45}$
$\overline{RT} = \sqrt{(9-1)^2+(2-7)^2} = \sqrt{125}$ → 'c' value (largest)

$(\sqrt{80})^2+(\sqrt{45})^2=(\sqrt{125})^2$
$80+45=125$
$125=125$ ✓

$\triangle RST$ is a right $\triangle$ b/c it satisfies the Pythagorean theorem

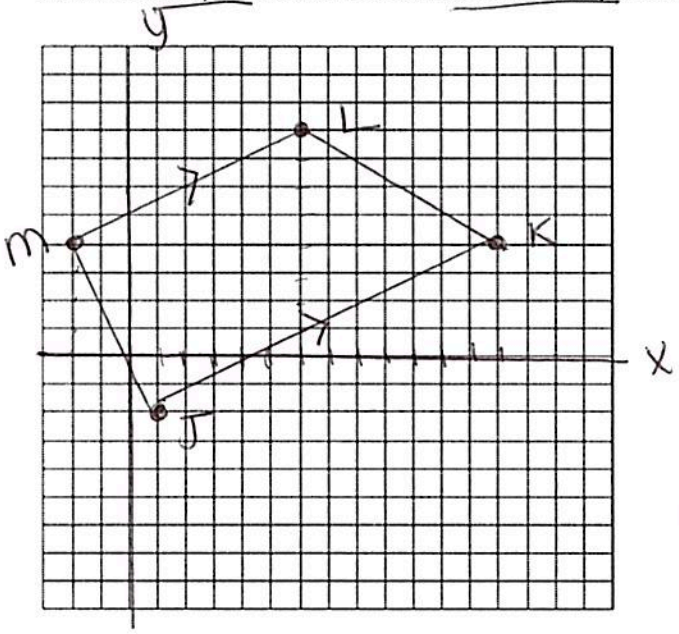
OPTION 2: SLOPE 3x

$RT = \frac{2-7}{9-1} = -\frac{1}{2}$
$\overline{RS} = \frac{-1-7}{3-1} = -2$
$\overline{ST} = \frac{2-1}{9-3} = \frac{1}{2}$

$\triangle RST$ is a right $\triangle$ b/c $RS \perp ST$ making $\angle S$ a right $\angle$.

trapezoid = SLOPE 4x!

14) The coordinates of quadrilateral *JKLM* are $J(1,-2)$, $K(13,4)$, $L(6,8)$, and $M(-2,4)$. Prove that quadrilateral *JKLM* is a trapezoid but *not* an isosceles trapezoid. [The use of the grid is optional.]



$\overline{JK} = \frac{4-2}{13-1} = \frac{1}{2}$

$\overline{KL} = \frac{8-4}{6-13} = -\frac{4}{7}$

$\overline{LM} = \frac{4-8}{-2-6} = \frac{1}{2}$

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

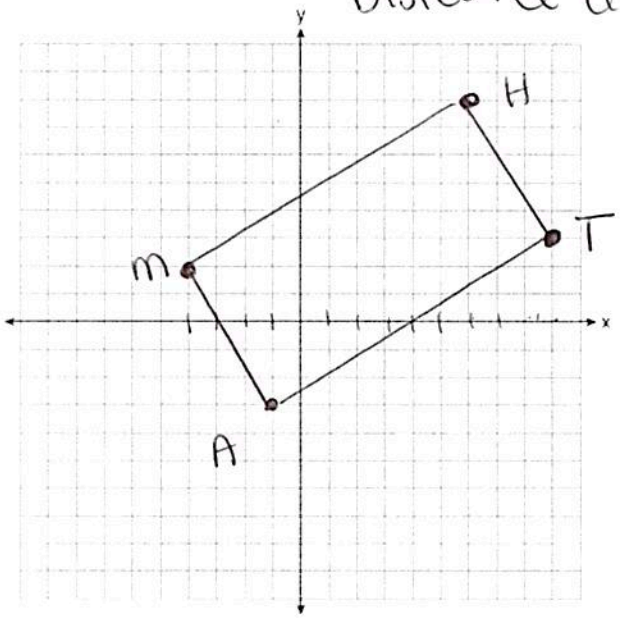
$\overline{MJ} = \sqrt{(-2-1)^2+(4-2)^2} = \sqrt{45}$

$\overline{LK} = \sqrt{(6-13)^2+(8-4)^2} = \sqrt{65}$

CONCLUSION: JKLM is a trapezoid b/c $\overline{JK} \parallel \overline{LM}$. It is not isosceles b/c $\overline{MJ} \not\cong \overline{LK}$

15) The vertices of quadrilateral *MATH* have coordinates $M(-4,2)$, $A(-1,-3)$, $T(9,3)$, and $H(6,8)$. Prove that quadrilateral *MATH* is a rectangle. [The use of the set of axes below is optional.]

distance (ax



$\overline{MA} = \sqrt{(-1-4)^2+(-3-2)^2} = \sqrt{34}$

$\overline{AT} = \sqrt{(9-1)^2+(3-3)^2} = \sqrt{136}$

$\overline{TH} = \sqrt{(6-9)^2+(8-3)^2} = \sqrt{34}$

$\overline{MH} = \sqrt{(6-4)^2+(8-2)^2} = \sqrt{136}$

$\overline{MT} = \sqrt{(9-4)^2+(3-2)^2} = \sqrt{170}$

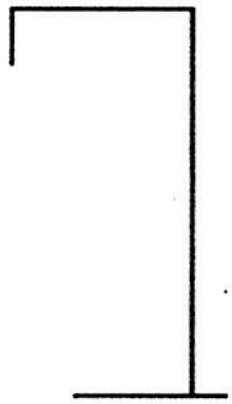
$\overline{AH} = \sqrt{(6-1)^2+(8-3)^2} = \sqrt{170}$

CONCLUSION: MATH is a rectangle b/c opp sides are $\cong$ and diagonals are $\cong$

HANG MAN GAME!

Directions:

- **Solve the questions on the review when you reach a smiley face check your answers.**
- If you get the correct answers, you may select a letter from the QR Code alphabet page.
- Scan the letter's QR code to find out if/where the letter is in the puzzle!
- If you pick a letter that is not in the puzzle, you must draw a body part on the hangman (head, right &left arm, torso, right and left leg, hands, feet, eyes, nose and mouth.)



Category: Who is the most famous person on Instagram in 2020?

Line 1: ___ ____ ____ ____ ____ ____ ____ ____ ____

Line 2: ___ ____ ____ ____ ____ ____ ____

Line 3: ___ ____ ____ ____ ____ ____

Line 4: ___ ____ ____ ____ ____ ____ ___ ___ ___ ___ ___ ___

HANG MAN GAME - ALPHABET

A 	B 	C 	D 	E 	F 
G 	H 	I 	J 	K 	L 
M 	N 	O 	P 	Q 	R 
S 	T 	U 	V 	W 	X 
Y 	Z FREE SPACE THERE ARE NO Z's.				