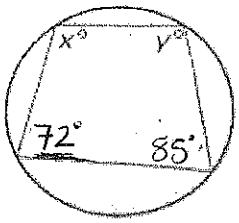
Final Exam Review Part II:

More Polygons & Quadrilaterals

1. **Calculate the value of x and y in the diagram below**



$x = 95°$
$y = 108°$

* opposite angles are supplementary

2. The measure of each interior angle of a regular polygon is ~~180°~~ 144°. How many sides does the polygon have?

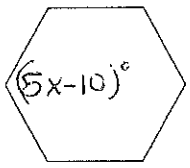
$$\frac{180(n-2)}{n} = 144$$

$180n - 360 = 144n$
$-180n \quad -180n$
$-360 = -36n$

$\frac{-360}{-36} = \frac{-36n}{-36}$

$10 = n$

3. Calculate the value of x in the regular hexagon shown below.



Sum of a hexagon = $180(6-2)$
$= 720°$

$6(5x-10) = 720$
$30x - 60 = 720$
$+60 \quad +60$
$\frac{30x}{30} = \frac{780}{30}$

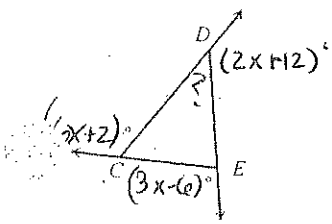
$x = 26$

4. What is the measure of an exterior angle if a regular polygon has 15 sides?

* Exterior Angle Sum ALWAYS 360°

$\frac{360}{15} =$ 24° each

5. Find m<EDC.



$2x + 12 + 6x + 2 + 3x - 6 = 360$

$11x + 8 = 360$

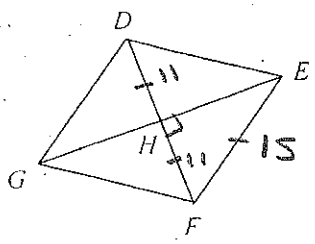
$\frac{11x}{11} = \frac{352}{11}$

$x = 32$

$2(32) + 12$
$64 + 12$
76

$m<EDC + 76 = 180$
$m<EDC = 104°$

6. If $\overline{EF}$ = 15 and $\overline{DF}$ = 22, find $\overline{EH}$. This is a rhombus.



$a^2 + b^2 = c^2$

$a^2 + (11)^2 = (15)^2$

$a^2 + 121 = 225$

$-121 \quad -121$

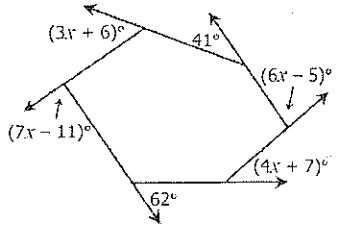
$a^2 = 104$

$\sqrt{a^2} = \sqrt{104}$

$a = 10.2$

$EH = 10.2$

7. Find x.



$3x+6+41+6x-5+4x+7+62+7x-11 = 360$

$20x + 100 = 360$

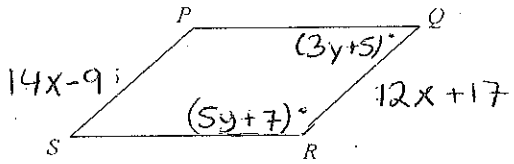
$-100 \quad -100$

$20x = 260$

$\frac{20x}{20} = \frac{260}{20}$

$x = 13$

8. If *PQRS* is a parallelogram, find the values of x and y.



$PS = QR$

$14x - 9 = 12x + 17$

$-12x \quad -12x$

$2x - 9 = 17$

$+9 \quad +9$

$\frac{2x}{2} = \frac{26}{2}$

$x = 13$

$\angle Q + \angle R = 180°$

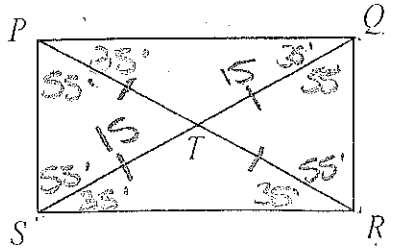
$3y+5+5y+7 = 180$

$8y + 12 = 180$

$\frac{8y}{8} = \frac{168}{8}$

$y = 21$

9. If *PQRS* is a rectangle, find each measure if ST = 15 and $\angle PRS = 35°$.



SQ = 30 $\quad \angle QPR = 35°$

PR = 30 $\quad \angle SQR = 55°$

Transformations

1. What is the image of (-9, 6) after a reflection across

(a) the y-axis? (9,6)

(b) the x-axis? (-9,-6)

2. What is the image of (7, -5) after a:

(a) 90° rotation about the origin? (y, -x) (-5, -7)

(b) 180° rotation about the origin? (-x, -y) (-7, 5)

(c) 270° rotation about the origin? (-y, x) (5, 7)

3. What is the image of (2, 3) after a translation according to $T_{<-4, 1>}$ AND a reflection over the x-axis? ① Translation = (-2, 4)
② reflection = (-2, -4)

Answer (-2, -4)

4. What is the image of (-9, -5) after a translation according to $T_{<-1, -6>}$?

(-10, -11)

5. If ΔABC has vertices A(-6, 5), B(-3, -1), C(0, 8), what are the image points after the translation: (x, y) → (x – 3, y + 7) ?

A' (-9, 12)

B' (-6, 6)

C' (-3, 15)

6. What are the image points of E(6, -2), J(2, 8), R(-4, -5), and S(-9, 6) if they were rotated 180° clockwise? All points (-x, -y)

E' (-6, 2)

J' (-2, -8)

R' (4, 5)

S' (9, -6)

7. If ΔEFG has vertices A(0, 5), B(7, -2), and C(6, 9), what are the image points after a reflection over the line x = 5 ?

Hint: Graph on a coordinate plane to help you.

A' (10, 5)

B' (3, -2)

C' (4, 9)

8. Point A(x, y) moves 9 units left and 1 units up. Write a rule that describes this translation.

$(x, y) \rightarrow (x-9, y+1)$

9. Point A(x, y) moves 3 units right and 4 units down. Write a rule that describes this translation.

$(x, y) \rightarrow (x+3, y-4)$

10. If the image of S'(-12, -6) underwent a dilation with a scale factor of 6, what are the coordinates of its pre-image?

divide each coordinate by 6

$\left(\frac{-12}{6}, \frac{-6}{6}\right)$

Pre-image = (-2, -1)

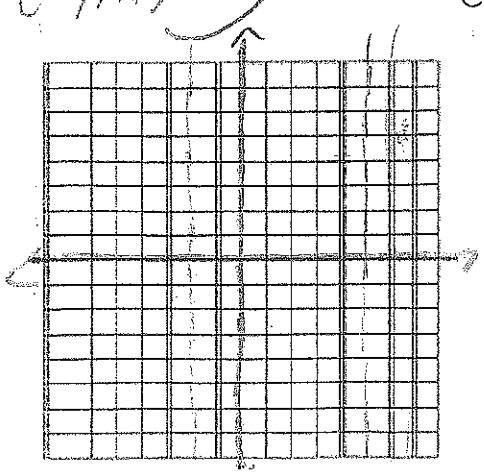
11. Use the pre-image points A (2, -2), B (3, 4), and C (-2, 1) to create an image after the following transformations:

- a translation of (x, y) → (x – 2, y + 1), A' = (0, -1), B' = (1, 5), C' = (-4, 2)
- A'' = (0, 5) a reflection over the line y = 2, and
- B'' = (1, -1) C'' = (-4, 2) a 90° counter-clockwise rotation (-y, x)

A''' (-5, 0)

B''' (1, 1)

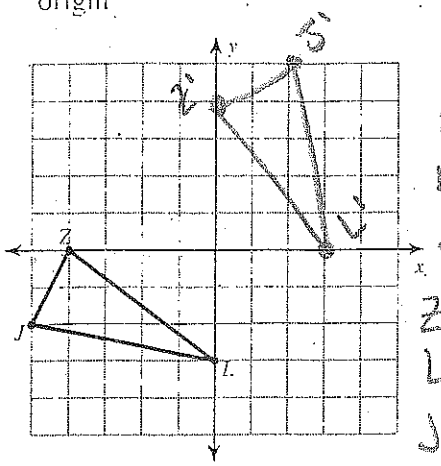
C''' (-2, -4)



All Transformations

Graph the image of the figure using the transformation given.

12) rotation 90° counterclockwise about the origin



$(-y, x)$

$Z = (4, 0)$

$L = (0, -3)$

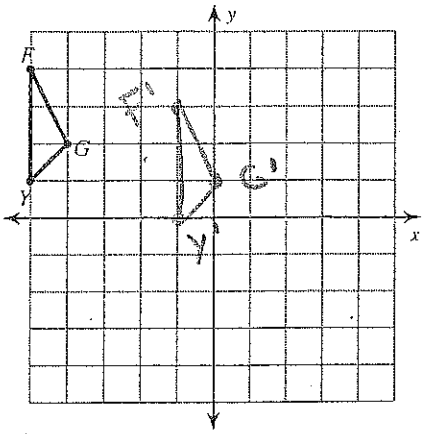
$J = (5, -2)$

$Z' = (0, 4)$

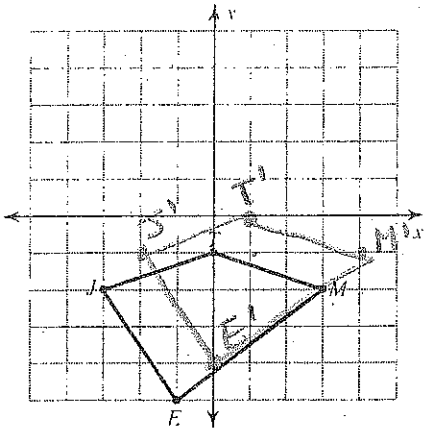
$L' = (3, 0)$

$J = (2, 5)$

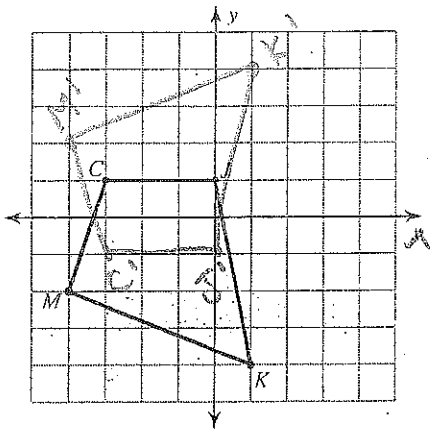
13 translation: 4 units right and 1 unit down



14 translation: 1 unit right and 1 unit up

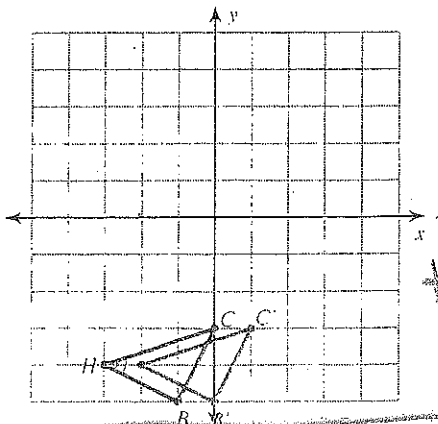


15 reflection across the x-axis



Write a rule to describe each transformation.

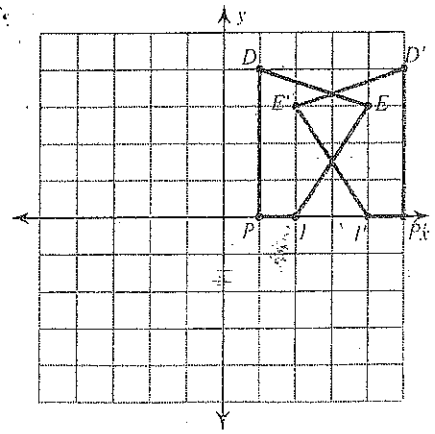
16.



translation right 1

$(x, y) \rightarrow (x+1, y)$

17.



reflection over $x = 3$