

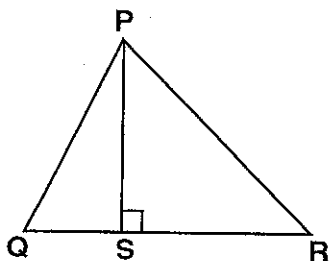
Review for Midterm

Name: _____

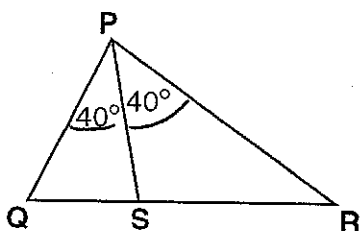
Questions 1 through 3 refer to the following:

In the given diagram, what type of line segment is \overline{PS} ?

1)

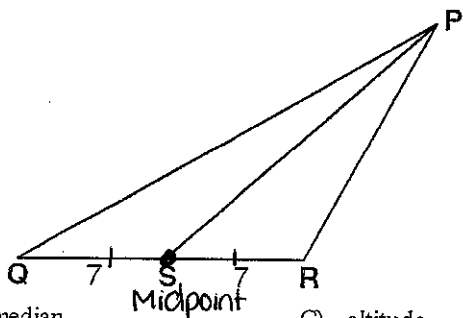


- A) median
 altitude \perp to base
 C) angle bisector



- A) median
 B) altitude
 angle bisector

3)



- median
 B) angle bisector
 C) altitude

Median connects a vertex to midpoint on opposite side

4) Under a dilation with respect to the origin, the image of $P(-15,6)$ is $P'(-5,2)$. What is the scale of dilation?

- A) 10
 $\frac{1}{3}$
 C) -4
 D) 3

$$\frac{\text{image}}{\text{preimage}} = \frac{-5}{-15} = \frac{1}{3}$$

5) If the point $(2,-5)$ is reflected in the line $y=x$, then the image is

- A) $(-5,-2)$
 $(-5,2)$
 C) $(5,-2)$
 D) $(-2,5)$

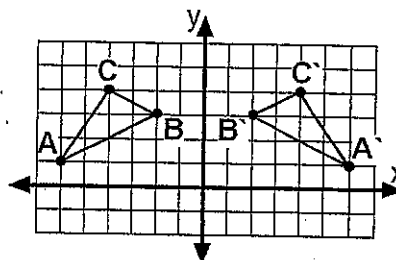
$$(x,y) \rightarrow (y,x)$$

6) If point $R'(6,3)$ is the image of point $R(2,1)$ under a dilation with respect to the origin, what is the constant of the dilation?

- A) 1
 B) 2
 3
 D) 6

$$\frac{\text{image}}{\text{preimage}} = \frac{6}{2} = 3$$

7) In the accompanying diagram, $\triangle A'B'C'$ is the image of $\triangle ABC$.



Which type of transformation is shown in the illustration?

- line reflection
 B) translation
 C) dilation
 D) rotation

8) Under a dilation where the center of dilation is the origin, the image of $A(-2,-3)$ is $A'(-6,-9)$. What are the coordinates of B' , image of $B(4,0)$ under the same dilation?

- A) $(-4,0)$
 B) $(-12,0)$
 $(12,0)$
 D) $(4,0)$

find scale factor first!

$$\frac{\text{image}}{\text{preimage}} = \frac{-6}{-2} = 3$$

- 9) The point $(-3, -2)$ is reflected in the origin. The coordinates of its image are
- R_{180°
 $(x, y) \rightarrow (-x, -y)$
- A) $(-2, -3)$
 B) $(2, 3)$
 C) $(3, 2)$
 D) $(-3, 2)$

10) What is the value of x that makes $l_1 \parallel l_2$?

$8x = 2x + 60$
 $-2x \quad -2x$
 $6x = 60$
 $6 \quad 6$
 $x = 10$

\cong corresponding angles

A) 10
 B) 12
 C) 6
 D) 20

11) What is the value of x that makes $l_1 \parallel l_2$?

$3x - 15 = 2x + 10$
 $-2x \quad -2x$
 $x - 15 = 10$
 $+15 \quad +15$
 $x = 25$

\cong alternate interior \angle s

A) 37
 B) 35
 C) 5
 D) 25

12) What is the congruence correspondence, if any, that will prove the given triangles congruent?

A) AAS
 B) SSA
 C) SAS
 D) none

13) If the measures of the angles of a triangle are represented by $(x + 30)^\circ$, $(4x + 30)^\circ$, and $(10x - 30)^\circ$, the triangle must be

A) obtuse (1 \angle greater.)
 B) right ($2 \angle$'s 90°)
 C) scalene (no $\cong \angle$ s)
 D) isosceles ($2 \cong \angle$ s)

$x + 30 + 4x + 30 + 10x - 30 = 180$
 $15x + 30 = 180$
 $-30 \quad -30$
 $15x = 150$
 $x = 10$

- 14) Which condition does not prove that two triangles are congruent?
- A) $ASA \cong ASA$
 B) $SSA \cong SSA$
 C) $SSS \cong SSS$
 D) $SAS \cong SAS$
- 15) What is the image of $A(8, 2)$ under R_{90° ? $(x, y) \rightarrow (-y, x)$
- A) $(8, -2)$
 B) $(-2, 8)$
 C) $(-8, 2)$
 D) $(2, 8)$

16) In the figure below $\overline{AB} \cong \overline{BC}$ isosceles \triangle

$72 + y + y = 180$
 $2y + 72 = 180$
 $-72 \quad -72$
 $2y = 108$
 $2 \quad 2$
 $y = 54$

$x + y = 180$
 $x + 54 = 180$
 $-54 \quad -54$
 $x = 126$

If $m\angle ABC = 72^\circ$, what is $m\angle BCD$?

A) 108°
 B) 72°
 C) 106°
 D) 126°

17) What is the sum of the measures of the interior angles of a hexagon?

$n = 6$

A) 360°
 B) 720°
 C) 540°
 D) $1,440^\circ$

$180(n-2)$
 $180(6-2)$
 $180(4)$
 720

18) What is the measure of each exterior angle of a regular polygon having 6 sides?

A) 45°
 B) 72°
 C) 120°
 D) 60°

$\frac{360}{n} = \frac{360}{6} = 60^\circ$

19) If translation T maps point $A(-3,1)$ onto point $A'(5,5)$, what is the translation T ?

- A) $T_{2,6}$
- B) $T_{8,6}$
- C) $T_{8,4}$
- D) $T_{2,4}$

20) The transformation $T_{-2,3}$ maps the point $(7,2)$ onto the point whose coordinates are

- A) $(5,5)$
- B) $(9,5)$
- C) $(-14,6)$
- D) $(5,-1)$

$$(7,2) \xrightarrow{T_{-2,3}} (5,5)$$

21) A translation moves $A(2,3)$ onto $A'(4,8)$. What are the coordinates of B' , the image of $B(4,6)$ under the same translation?

- A) $(12,18)$
- B) $(6,8)$
- C) $(6,11)$
- D) $(8,12)$

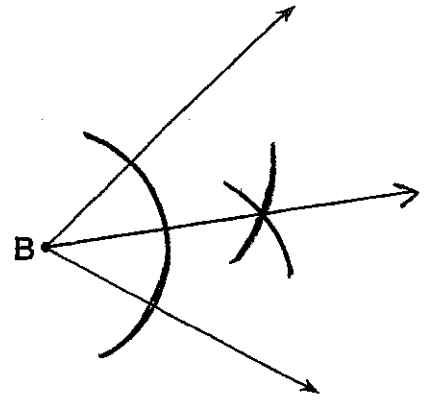
$$B(4,6) \xrightarrow{T_{2,5}} B'(6,11)$$

$\triangle ABC$ has vertices $A(-5,4)$, $B(-2,3)$ and $C(6,-1)$. Find the coordinates of the images of the vertices of $\triangle ABC$ under the given glide reflection.

$T_{0,-3}$ ◦ $r_{y\text{-axis}}$

$A(-5,4) \rightarrow A'(5,4) \rightarrow A''(5,1)$
$B(-2,3) \rightarrow B'(2,3) \rightarrow B''(2,0)$
$C(6,-1) \rightarrow C'(-6,-1) \rightarrow C''(-6,-4)$

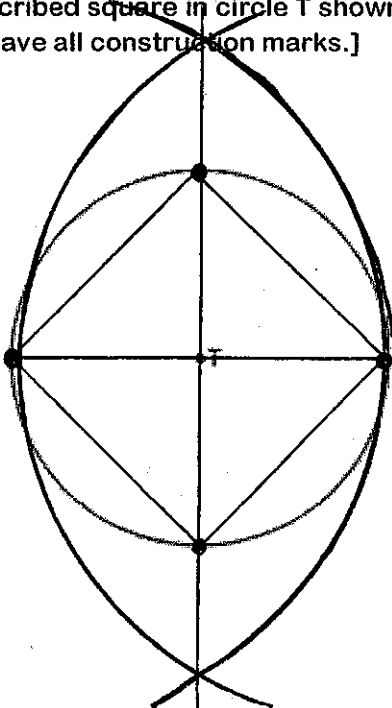
23) Construct the ray that bisects $\angle B$.



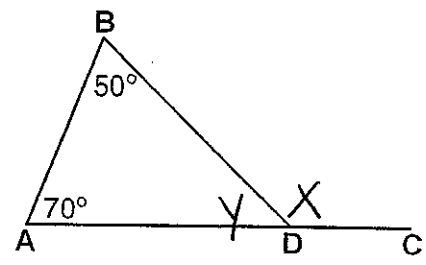
24) Point $(-3,4)$ is rotated 180° about the origin in a counterclockwise direction. What are the coordinates of its image?

$(3,-4)$

3a) Use a compass and straightedge to construct an inscribed square in circle T shown below. [Leave all construction marks.]



25) In the accompanying diagram of $\triangle ABD$, $m\angle A = 70^\circ$ and $m\angle B = 50^\circ$.



Find the measure of exterior angle BDC .

$$50 + 70 = X \quad \text{or} \quad 50 + 70 + Y = 180$$

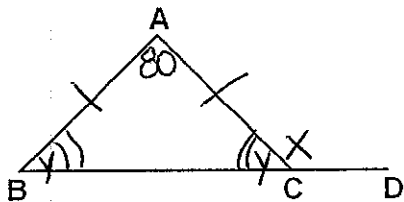
$120 = X$

$$120 + Y = 180$$

$$\begin{array}{r} 120 + Y = 180 \\ -120 \quad -120 \\ \hline Y = 60 \end{array}$$

$$\begin{array}{r} X + Y = 180 \\ X + 60 = 180 \\ -60 \quad -60 \\ \hline X = 120 \end{array}$$

- 26) In the accompanying diagram, $\triangle ABC$ is isosceles, \overline{BC} is extended to D, $\overline{AB} \cong \overline{AC}$, and $m\angle A = 80^\circ$.



Find $m\angle ACD$.

$$\begin{aligned} y + y + 80 &= 180 \\ 2y + 80 &= 180 \\ -80 &-80 \\ \hline 2y &= 100 \\ \frac{2y}{2} &= \frac{100}{2} \\ y &= 50 \end{aligned}$$

$$\begin{aligned} x + y &= 180 \\ x + 50 &= 180 \\ -50 &-50 \\ \hline x &= 130 \end{aligned}$$

- 27) Find the measure of each interior angle of a regular polygon of 5 sides.

$$\frac{360}{n} = \frac{360}{5} = 72 = \text{ext } \angle$$

$$\begin{aligned} \text{int } \angle + \text{ext } \angle &= 180 \\ x + 72 &= 180 \\ -72 &-72 \\ \hline x &= 108 \end{aligned}$$

- 30) Triangle ABC has coordinates A(-1,3), B(-6,5), and C(-4,7).

(a) On graph paper, draw and label $\triangle ABC$.

(b) Graph and label $\triangle A'B'C'$, the image of $\triangle ABC$ after a reflection in the x-axis.

$$(x, y) \rightarrow (x, -y) \quad A'(-1, -3) \quad B'(-6, -5) \quad C'(-4, -7)$$

(c) Graph and label $\triangle A''B''C''$, the image of $\triangle ABC$ after a reflection in the line $y = x$.

$$(x, y) \rightarrow (y, x) \quad A''(-3, -1) \quad B''(-5, -6) \quad C''(-7, -4)$$

(d) Graph and label $\triangle A'''B'''C'''$, the image of $\triangle ABC$ under the translation which maps (x, y) to $(x + 8, y + 3)$.

$$A'''(5, 2) \quad B'''(3, -3) \quad C'''(1, -1)$$

- 31) What is the slope of the line containing points A(4,-1) and B(0,2)?

- A) $-\frac{4}{3}$
 B) $-\frac{3}{4}$

- C) $\frac{3}{4}$
 D) $\frac{4}{3}$

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = \frac{-1 - 2}{4 - 0} = \frac{-3}{4}$$

$$\begin{array}{r|l} x & y \\ 4 & -1 \\ 0 & 2 \end{array}$$

- 32) What are the coordinates of the midpoint of the line segment whose endpoints are (2,6) and (10,4)?

- A) (4,1)
 B) (5,6)

- C) (12,10)
 D) (6,5)

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

$$\left(\frac{2+10}{2}, \frac{6+4}{2} \right)$$

$$\left(\frac{12}{2}, \frac{10}{2} \right) = (6, 5)$$

$$\begin{array}{r|l} x & y \\ 2 & 6 \\ 10 & 4 \end{array}$$

- 33) Write an equation of the line that is the perpendicular bisector of the line segment having endpoints of (-4,-2) and (8,4).

Step 1: slope $m = \frac{-2 - 4}{-4 - 8} = \frac{-6}{-12} = \frac{1}{2}$

Step 4: point-slope
 $y - y_1 = m(x - x_1)$
 $y - 1 = -2(x - 2)$

* Step 2: \perp slope = -2

* Step 3: midpoint $\left(\frac{-4+8}{2}, \frac{-2+4}{2} \right) = \left(\frac{4}{2}, \frac{2}{2} \right) = (2, 1)$

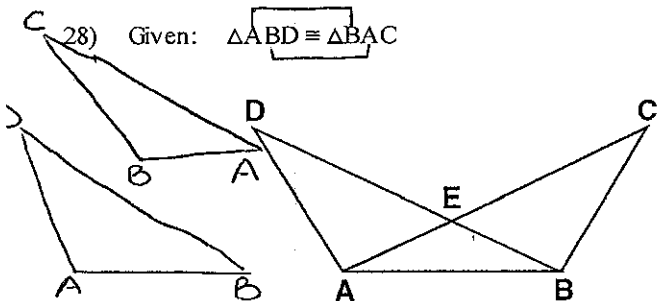
- 34) Write an equation of the line perpendicular to the line $y = 4x - 9$ and passing through the point (3,2).

$m = 4$
 $\perp m = -\frac{1}{4}$
 point = (3, 2)
 point-slope

$$y - y_1 = m(x - x_1)$$

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

- 28) Given: $\triangle ABD \cong \triangle BAC$



Name three pairs of congruent angles and three pairs of congruent sides.

$$\begin{aligned} CB &\cong DA & \angle C &\cong \angle D \\ BA &\cong AB & \angle A &\cong \angle B \\ CA &\cong DB & \angle B &\cong \angle A \end{aligned}$$

- 29) What are the coordinates of A', the image of A(2,3) after a reflection in the x-axis?

$$(x, y) \rightarrow (x, -y)$$

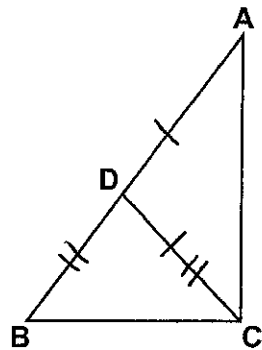
$$A(2, 3) \rightarrow A'(2, -3)$$

35) Write an equation of the line that is parallel to $y = 3x - 5$ and that passes through the point $(1, 6)$.

$m = 3$
 pt = $(1, 6)$
 point slope $y - y_1 = m(x - x_1)$
 $y - 6 = 3(x - 1)$

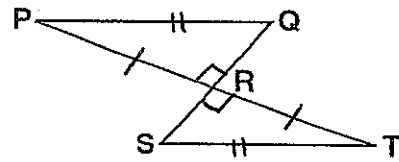
Questions 37 and 38 refer to the following:

Supply the missing reason(s) for the given proof.



37)

STATEMENTS	REASONS
(1) $AD = DC$ $DC = DB$	(1) Given
(2) $AD = DB$	(2) Transitive



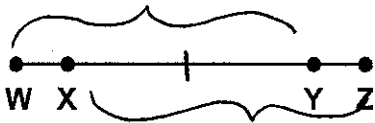
36)

Given: $\overline{PT} \perp \overline{QS}$
 R is the midpoint of \overline{PT}
 $PQ \cong ST$

Prove: $\overline{PQ} \parallel \overline{ST}$

S	R
① $PT \perp QS$	① Given
② $\angle 1$ & $\angle 2$ are right \angle s	② \perp lines form right \angle s
③ $\angle 1 \cong \angle 2$	③ All right \angle s are \cong
④ R is the mdpt of PT	④ Given
⑤ $PR \cong TR$	⑤ A midpoint divides a segment into 2 \cong segments
⑥ $PQ \cong ST$	⑥ Given
⑦ $\triangle PRQ$ & $\triangle TRS$ are right \triangle s	⑦ Right \triangle s have 1 right \angle
⑧ $\triangle PRQ \cong \triangle TRS$	⑧ HL \cong HL
⑨ $\angle P \cong \angle T$ or $\angle Q \cong \angle S$	⑨ CPCTC
⑩ $PQ \parallel ST$	⑩ If alternate interior \angle s are \cong , then the lines cut by the transversal are \parallel

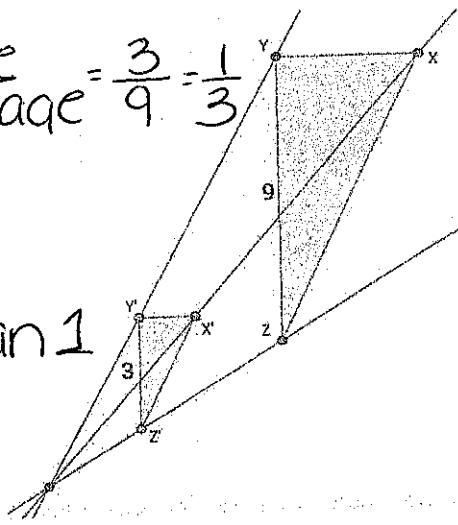
38)



STATEMENTS	REASONS
(1) $WY = XZ$	(1) Given
(2) $XY = XY$	(2) Reflexive
(3) $WX = YZ$	(3) Subtraction Postulate

- 39.) A) Find the scale factor of the dilation.
 B) Determine if it is a reduction or an enlargement. Explain why.

$$\frac{\text{image}}{\text{preimage}} = \frac{3}{9} = \frac{1}{3}$$

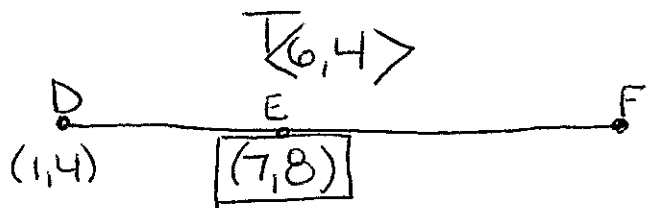
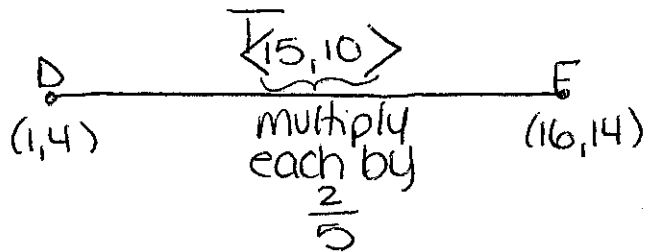


Reduction

The scale factor is less than 1

- 40.) The endpoints of \overline{DEF} are $D(1,4)$ and $F(16,14)$. Determine and state the coordinates of point E , if $DE:EF = 2:3$.

Total 5



- 41.) Directed line segment PT has endpoints whose coordinates are $P(-2,1)$ and $T(4,7)$. Determine the coordinates of point J that divides the segment in the ratio 2 to 1.

Total 3

