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Date _____
Geometry

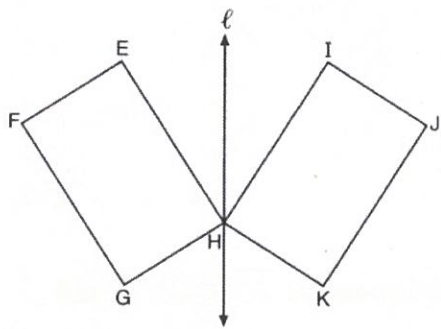
CCG Schlansky's Guide to 65 Review!

1. The vertices of $\triangle JKL$ have coordinates $J(5,1)$, $K(-2,-3)$, and $L(-4,1)$. Under which transformation is the image $\triangle J'K'L'$ not congruent to $\triangle JKL$?

- 1) a translation of two units to the right and two units down
- 2) a counterclockwise rotation of 180 degrees around the origin
- 3) a reflection over the x -axis
- 4) a dilation with a scale factor of 2 and centered at the origin

dilation is only one that's not congruent

2. In the diagram below, parallelogram $EFGH$ is mapped onto parallelogram $IJKH$ after a reflection over line ℓ . Use the properties of rigid motions to explain why parallelogram $EFGH$ is congruent to parallelogram $IJKH$.



A reflection is a rigid motion. A rigid motion preserves size and angle measure producing a congruent figure

3. Which rotation about its center will carry a regular ¹⁰decagon onto itself?

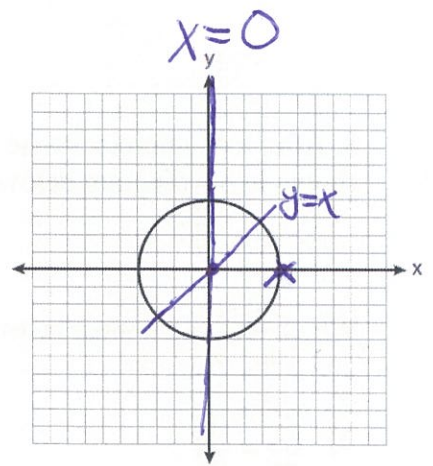
- 1) 54°
- 2) 162°
- 3) 198°
- 4) 252° *36(7)*

$$\frac{360}{10} = 36$$

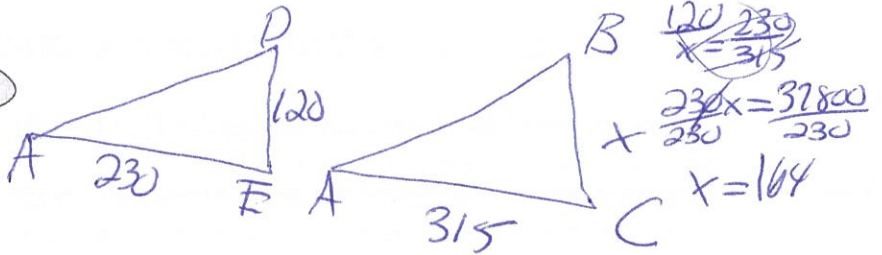
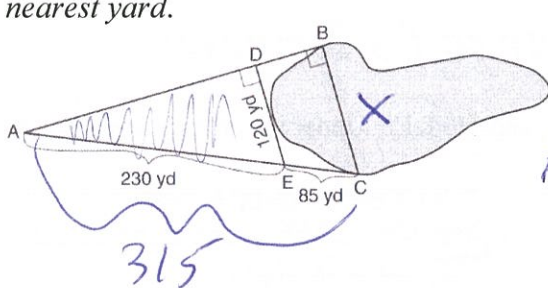
4. In the diagram below, which transformation does *not* map the circle onto itself?

- 1) Rotation of 80 centered at the origin ✓
- 2) Reflection over the line $y = x$ ✓
- 3) Rotation of 180 centered at $(4,0)$ ✗
- 4) Reflection over the line $x = 0$ ✓

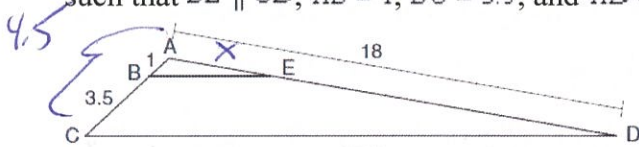
*line of reflection = line of symmetry
center of rotation = center of shape*



5. To find the distance across a pond from point B to point C , a surveyor drew the diagram below. The measurements he made are indicated on his diagram. Use the surveyor's information to determine and state the distance from point B to point C , to the nearest yard.



6. In the diagram below, triangle ACD has points B and E on sides \overline{AC} and \overline{AD} , respectively, such that $\overline{BE} \parallel \overline{CD}$, $AB = 1$, $BC = 3.5$, and $AD = 18$.



What is the length of \overline{AE} , to the nearest tenth?

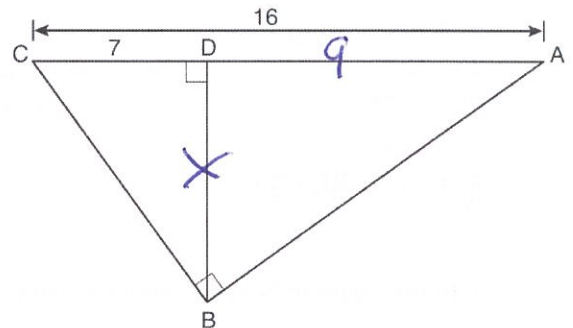
$$\frac{\text{top}}{\text{top}} = \frac{\text{side}}{\text{side}}$$

$$\frac{1}{x} = \frac{4.5}{18}$$

$$\frac{4.5x}{4.5} = \frac{18}{4.5}$$

$$x = 4.0$$

7. In the diagram below of right triangle ABC , altitude \overline{BD} is drawn to hypotenuse \overline{AC} , $AC = 16$, and $CD = 7$.



What is the length of \overline{BD} to the nearest tenth?

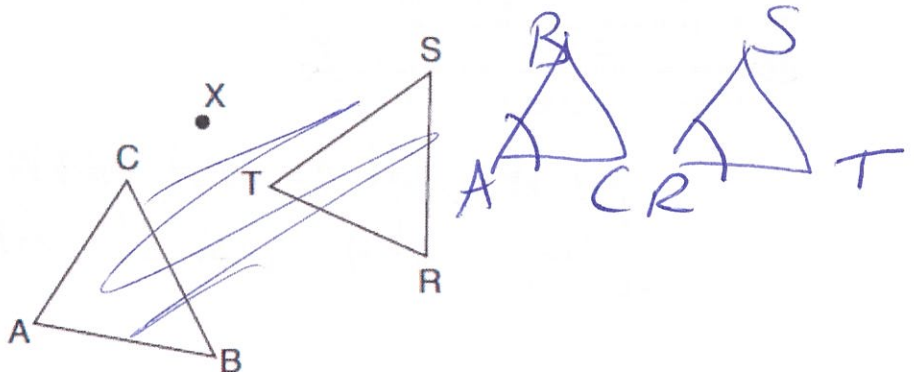
$$\frac{H}{L} = \frac{L}{S}$$

$$\frac{8}{A} = \frac{A}{5}$$

$$\frac{7}{x} = \frac{x}{9}$$

$$\sqrt{x^2 = 63} = 7.9$$

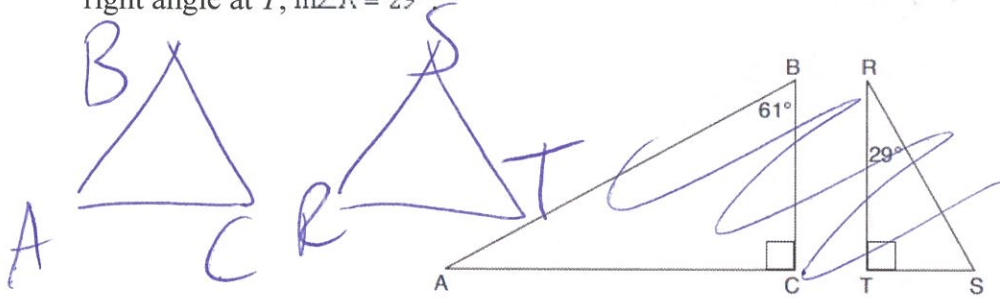
8. After a counterclockwise rotation about point X , scalene triangle ABC maps onto $\triangle RST$, as shown in the diagram below.



Which statement must be true?

- 1) $\angle A \cong \angle R$
- 2) $\angle A \cong \angle S$
- 3) $\overline{CB} \cong \overline{TR}$
- 4) $\overline{CA} \cong \overline{TS}$

9. Given right triangle ABC with a right angle at C , $m\angle B = 61^\circ$. Given right triangle RST with a right angle at T , $m\angle R = 29^\circ$



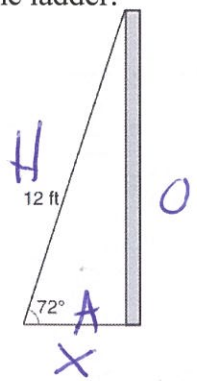
Which proportion in relation to $\triangle ABC$ and $\triangle RST$ is *not* correct?

- 1) $\frac{AB}{RS} = \frac{AC}{RT}$ ✓
- 2) $\frac{BC}{ST} = \frac{AB}{RS}$ ✓
- 3) $\frac{BC}{ST} = \frac{AC}{RT}$ ✓
- 4) $\frac{AB}{AC} = \frac{RS}{RT}$ ✓

10. As shown in the diagram below, a ladder 12 feet long leans against a wall and makes an angle of 72° with the ground.

Find, to the nearest tenth of a foot, the distance from the wall to the base of the ladder.

SOH CAH TOA
 $\cos \theta = \frac{A}{H}$
 $\cos 72^\circ = \frac{x}{12}$
 $x = 12 \cos 72^\circ$
 $x = 3.7$

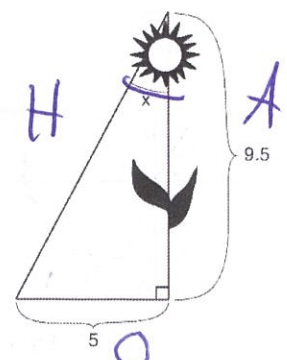


11. The diagram below shows the path a bird flies from the top of a 9.5-foot-tall sunflower to a point on the ground 5 feet from the base of the sunflower.

To the nearest tenth of a degree, what is the measure of angle x ?

- 1) 27.8
- 2) 31.8
- 3) 58.2
- 4) 62.2

SOH CAH TOA
 $\tan \theta = \frac{O}{A}$
 $\tan x = \frac{5}{9.5}$
 $x = \tan^{-1}(\frac{5}{9.5})$
 $x = 27.8$



12. Right triangle TMR is a scalene triangle with the right angle at M . Which equation is true?

- 1) $\sin M = \cos T$
- 2) $\sin R = \cos R$
- 3) $\sin T = \cos R$ ✓
- 4) $\sin T = \cos M$

$\sin A = \cos B$ where A and B are acute

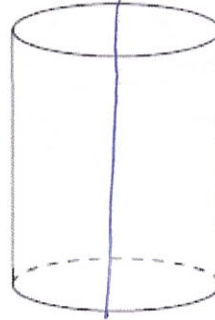


13. In a right triangle, $\sin(40 - x)^\circ = \cos(3x)^\circ$. What is the value of x ?

- 1) 10
2) 15
3) 20
4) 25

$\sin A = \cos B$
 $A + B = 90$
 $40 - x + 3x = 90$
 $2x + 40 = 90$
 $2x = 50$
 $x = 25$

14. A plane intersects a cylinder perpendicular to its bases.



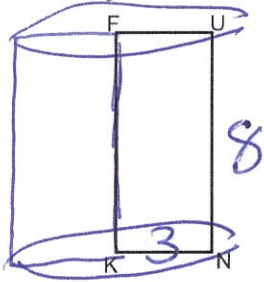
This cross section can be described as a

- 1) rectangle
2) parabola
3) triangle
4) circle

15. Find the volume of a cone with a height of 12 in and a diameter of 8 in rounded to the nearest hundredth.

$V = \frac{1}{3} \pi r^2 h$
 $V = \frac{1}{3} \pi (4)^2 (12)$
 $V = 201.06$

16. In the rectangle below, $\overline{UN} = 8 \text{ in}$ and $\overline{KN} = 3 \text{ in}$. Find the volume of the three dimensional object created by rotating rectangle \overline{FUNK} continuously about side \overline{FK} in terms of π .



$V = \pi r^2 h$
 $V = \pi (3)^2 (8)$
 $V = 72\pi$

don't type π in

17. Find the center and radius of the circle whose equation is $x^2 + y^2 + 6x - 2y - 4 = 22$.

$x^2 + 6x + y^2 - 2y = 26$
 $\left(\frac{6}{2}\right)^2 = 9$ $\left(\frac{-2}{2}\right)^2 = 1$ $+4 +4$

$x^2 + 6x + 9 + y^2 - 2y + 1 = 26 + 9 + 1$

$(x+3)(x+3) + (y-1)(y-1) = 36$

$(x+3)^2 + (y-1)^2 = 36$

center: $(-3, 1)$

radius: 6

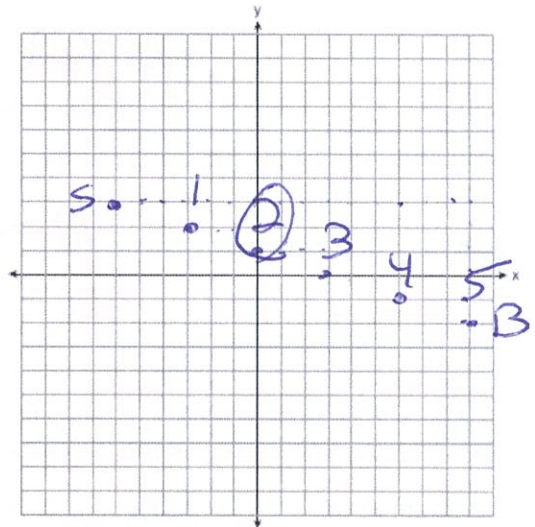
22. Directed line segment SB has endpoints whose coordinates are $S(-6,3)$ and $B(9,-2)$. Determine the coordinates of point J that divides the segment in the ratio 2 to 3. $2+3=5$

$$\frac{\Delta x}{p} \quad \frac{\Delta y}{p}$$

$$\frac{15}{5} \quad \frac{-5}{5}$$

$$3 \quad 1$$

$(0,1)$



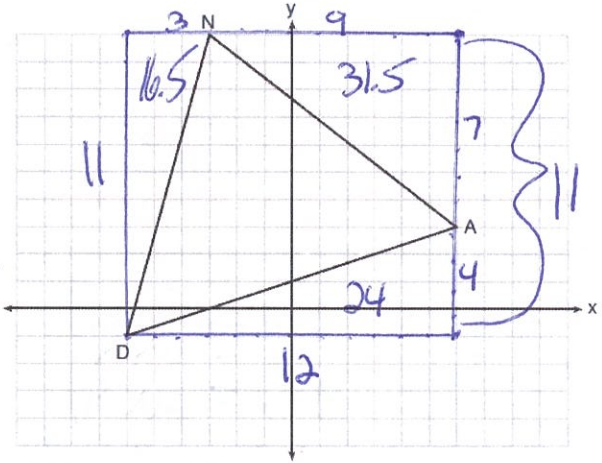
23. Triangle DAN is graphed on the set of axes below. The vertices of $\triangle DAN$ have coordinates $D(-6,-1)$, $A(6,3)$, and $N(-3,10)$.

What is the area of $\triangle DAN$?

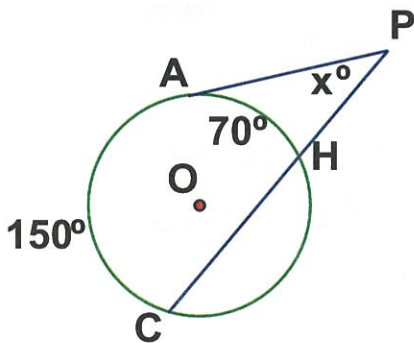
- 1) 60
- 2) 120
- 3) $20\sqrt{13}$
- 4) $40\sqrt{13}$

$$\begin{array}{r} 16.5 \\ + 31.5 \\ + 24 \\ \hline 72 \end{array} \quad \begin{array}{r} 132 \\ - 72 \\ \hline 60 \end{array}$$

$A_1 = lw$
 $A_1 = (2)(11) = 22$
 $A_2 = \frac{1}{2}lw$
 $= \frac{1}{2}(3)(11) = 16.5$
 $A_3 = \frac{1}{2}(9)(7) = 31.5$
 $A_4 = \frac{1}{2}(12)(4) = 24$



24. In Circle O , $m\widehat{AC} = 150$ and $m\widehat{AH} = 70$. Find $m\angle P$



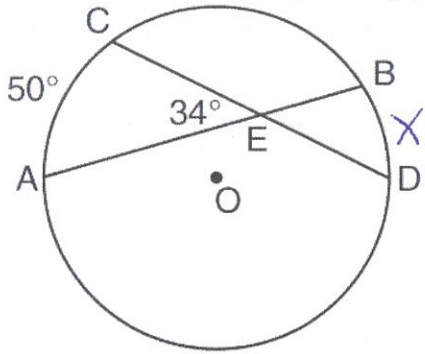
$$2(\angle A) = \text{major} - \text{minor}$$

$$2(x) = 150 - 70$$

$$\frac{2x}{2} = \frac{80}{2}$$

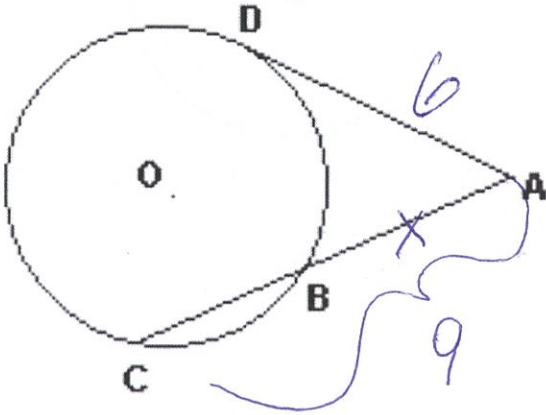
$$x = 40$$

25. In the diagram below of circle O , chords \overline{AB} and \overline{CD} intersect at E . If $m\angle AEC = 34$ and $m\widehat{AC} = 50$, what is $m\widehat{DB}$?



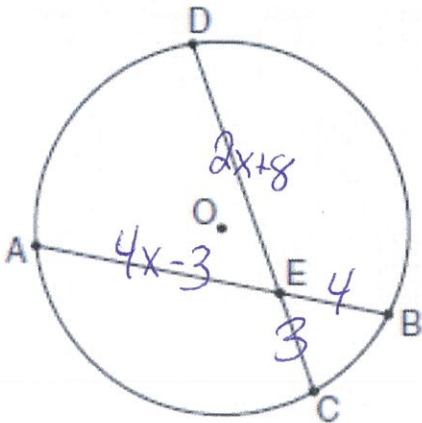
$$\begin{aligned} 2(\angle A) &= \text{arc} + \text{arc} \\ 2(34) &= x + 50 \\ 68 &= x + 50 \\ -50 &\quad -50 \\ 18 &= x \end{aligned}$$

26. In the diagram, \overline{AD} is tangent to circle O at D , and \overline{CBA} is a secant. If $AD = 6$ and $AC = 9$, what is AB ?



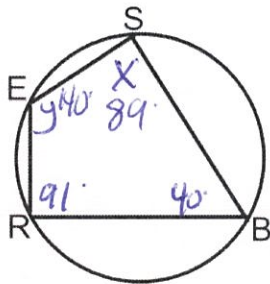
$$\begin{aligned} w \cdot e &= w \cdot e \\ 6 \cdot 6 &= 9 \cdot x \\ \frac{36}{9} &= \frac{9x}{9} \\ 4 &= x \end{aligned}$$

27. In the diagram of circle O below, chord \overline{AB} intersects chord \overline{CD} at E , $DE = 2x + 8$, $EC = 3$, $AE = 4x - 3$, and $EB = 4$. What is the value of x ?



$$\begin{aligned} p \cdot p &= p \cdot p \\ 3(2x+8) &= 4(4x-3) \\ 6x+24 &= 16x-12 \\ -6x &\quad -6x \\ 24 &= 10x-12 \\ +12 &\quad +12 \\ 36 &= 10x \\ \frac{36}{10} &= \frac{10x}{10} \\ 3.6 &= x \end{aligned}$$

28. In the diagram below, quadrilateral $SBRE$ is inscribed in the circle. If $m\angle BRE = 91^\circ$ and $m\angle SBR = 40^\circ$, find $m\angle BSE$ and $m\angle SER$



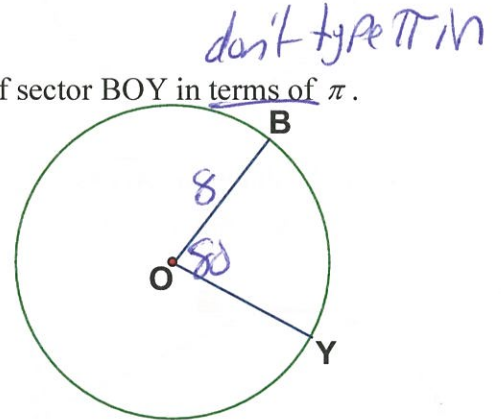
opposite angles add to 180°

$$\begin{array}{r} 91 + x = 180 \\ -91 \quad -91 \\ \hline x = 89 \end{array} \qquad \begin{array}{r} 40 + y = 180 \\ -40 \quad -40 \\ \hline y = 140 \end{array}$$

29. In circle O, if $\angle BOY = 80^\circ$ and $\overline{BO} = 8 \text{ cm}$, find the area of sector BOY in terms of π .

$$A = \frac{\theta \pi r^2}{360}$$

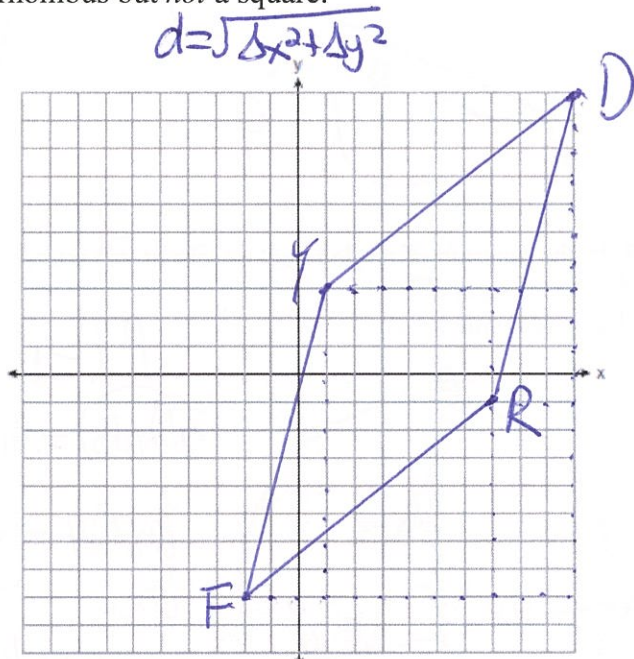
$$A = \frac{80 \pi (8)^2}{360} = \frac{128}{9} \pi$$



30. Quadrilateral $FRDY$ has vertices $F(-2, -8)$, $R(7, -1)$, $D(10, 10)$ and $Y(1, 3)$. Using coordinate geometry, prove that quadrilateral $FRDY$ is a rhombus but *not* a square.

1) $FRDY$ is a rhombus because all sides are congruent. It is not a square because diagonals are not congruent.

$$\begin{aligned} 2) d_{\overline{YD}} &= \sqrt{9^2 + 7^2} = \sqrt{81 + 49} = \sqrt{130} \\ d_{\overline{DR}} &= \sqrt{3^2 + 11^2} = \sqrt{9 + 121} = \sqrt{130} \\ d_{\overline{RF}} &= \sqrt{9^2 + 7^2} = \sqrt{81 + 49} = \sqrt{130} \\ d_{\overline{FY}} &= \sqrt{3^2 + 11^2} = \sqrt{9 + 121} = \sqrt{130} \\ d_{\overline{YR}} &= \sqrt{6^2 + 4^2} = \sqrt{36 + 16} = \sqrt{52} \\ d_{\overline{FD}} &= \sqrt{12^2 + 18^2} = \sqrt{144 + 324} = \sqrt{468} \end{aligned}$$



3) $\overline{YD} \cong \overline{DR} \cong \overline{RF} \cong \overline{FY}$ because they have the same distance
 $\overline{YR} \not\cong \overline{FD}$ because they don't have the same distance.