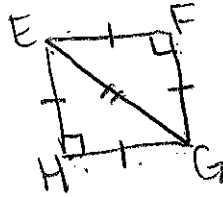Geometry Review   Name __*Key*__ A#_____

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1. Given *EFGH* is a square with a diagonal drawn from $\angle E$ to $\angle G$. Complete the proof that $\Delta EFG \cong \Delta GHE$.

   a. Is $\overline{EF} \cong \overline{GH}$ and $\overline{FG} \cong \overline{HE}$ true? Why?
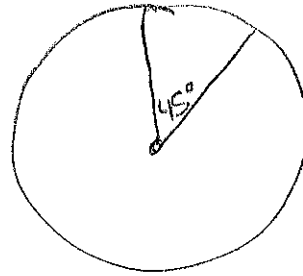
   B/c sides of sq. are ≅

   b. Is $\overline{EG} \cong \overline{EG}$ true? Why?

   Reflexive Prop.
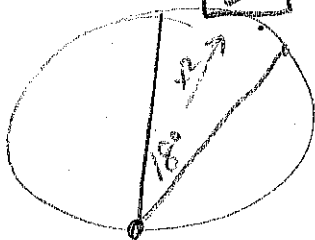
   c. Is $\Delta EFG \cong \Delta GHE$ true? Why?

   SSS , SAS , HL ...

2. What is the measure of a central angle with an arc measure of 45°?

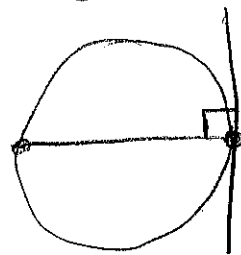
   $\boxed{45°}$

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3. What is the measure of the arc with an inscribed angle of 18°?

   $\boxed{36°}$

4. What is the measure of the angle formed between a tangent and the diameter of a circle?

   $\boxed{90°}$

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5. Given an arc length of 20 ft and $\theta = 90°$, find the radius of the circle.

   $90° = \frac{\pi}{2}$

   $S = r\theta$ ✓

   $20 = r\left(\frac{\pi}{2}\right)$

   $\frac{40}{\pi} = r$

   $\boxed{12.73 ft \approx r}$

   $\frac{part}{whole} = \frac{part}{whole}$

   $\frac{20}{2\pi r} \times \frac{90°}{360°}$

   $7200 = 180\pi r$
   $\frac{7200}{180\pi} = \frac{180\pi r}{180\pi}$ $\boxed{r \approx 12.73\ ft}$

6. Given a radius with length 4.5 inches and $\theta = \frac{\pi}{6}$, find the area of the sector.

   $\frac{part}{whole} = \frac{part}{whole}$

   $\frac{sector\ area}{(4.5)^2\pi} \times \frac{\pi/6}{2\pi}$

   $\frac{2\pi x}{2\pi} = \frac{3.375\pi^2}{2\pi}$ 1.6875π $\boxed{x \approx 5.3\ in^2}$

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7. What is the equation of the circle with center at (4, -3) and radius of 2?

   a. $(x-4)^2 + (y+3)^2 = 2$

   b. $(x-4)^2 + (y+3)^2 = 4$

   c. $(x+4)^2 + (y-3)^2 = 4$

   d. $(x-4)^2 - (y-3)^2 = 4$

8. What are the center and radius of the circle described by the equation
   $x^2 + y^2 - 18x + 12y + 68 = 0$?

   a. Center (6, -9); radius 7

   b. Center (-9, 6); radius 7

   c. Center (-6, 9); radius 7

   d. Center (9, -6); radius 7

   $x^2 - 18x + 81 + y^2 + 12y + 36$
   $= -68 + 81 + 36$
   $(x-9)^2 + (y+6)^2 = 49$

9. The diameter of a circle is 8 centimeters. A central angle of the circle intercepts an arc of 12 centimeters. What is the radian measure of the angle?
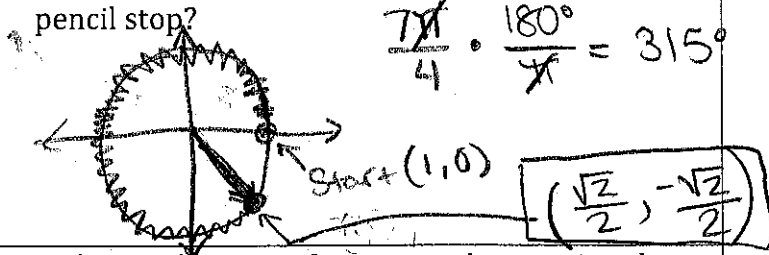
$$\frac{part}{whole} = \frac{part}{whole}$$

$$\frac{12}{\pi(8)} = \frac{x}{2\pi} \longrightarrow \frac{24\pi}{8\pi} = \frac{8\pi x}{8\pi}$$
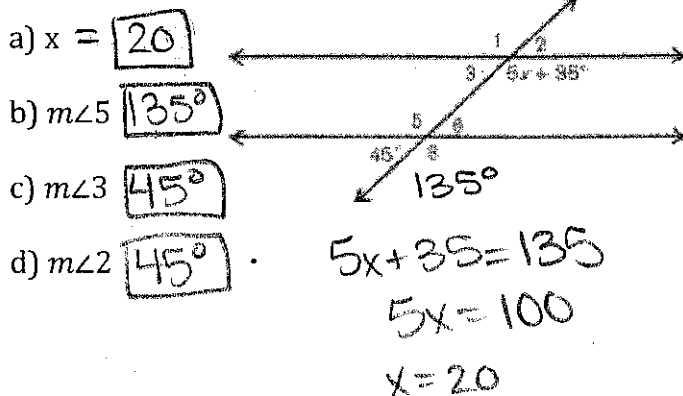
$$\boxed{3 = x \text{ radians}}$$

10. Carla put her pencil on the outer edge of a graph of the unit circle at the point $(1, 0)$. She moved her pencil tip through an angle of $\frac{7\pi}{4}$ radians counterclockwise along the edge of the unit circle. At what point on the unit circle did Carla's pencil stop?

$$\frac{7\pi}{4} \cdot \frac{180°}{\pi} = 315°$$

Start $(1, 0)$

$$\boxed{\left(\frac{\sqrt{2}}{2}, -\frac{\sqrt{2}}{2}\right)}$$

11. Given that the two lines in the figure below are parallel, find each of the following values:

a) x = $\boxed{20}$

b) $m\angle 5$ $\boxed{135°}$

c) $m\angle 3$ $\boxed{45°}$

d) $m\angle 2$ $\boxed{45°}$

1 2
3 / 5x + 35°

5 6
45° / 8

135°

$$5x + 35 = 135$$
$$5x = 100$$
$$x = 20$$

12. A glass maker is crafting a vase by creating the cone below and cutting the top section off. What will be the volume of the resulting base after the small end of the cone with a radius of 2.5 cm and height of 6 cm is removed?

2.5 — 6
60 cm
← 56 cm →

$$V_{cone} = \frac{1}{3}\pi r^2 h$$
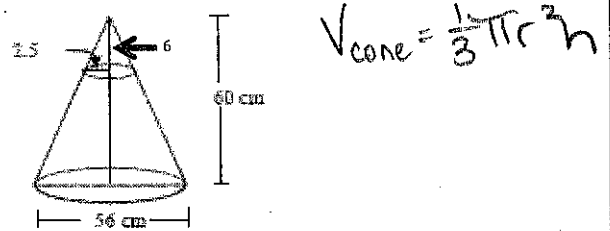
large cone $= \frac{1}{3}\pi(28)^2(60) = 15680\pi$
small cone $= \frac{1}{3}\pi(2.5)^2(6) = 12.5\pi$
large - small $= 15680\pi - 12.5\pi = \boxed{15667.5\pi}$

$$\boxed{\text{or} \approx 49220.9 \text{ cm}^3}$$

13. In the diagram of $\triangle OMP$ and $\triangle OQN$, $\angle M \cong \angle Q$ and $\overline{MO} \cong \overline{QO}$. Based on the diagram, write a proof showing $\overline{MN} \cong \overline{QP}$.
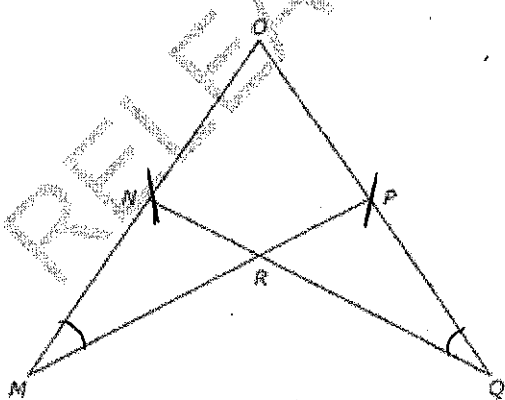
Statements	Reasons
1) $\angle M \cong \angle Q$	1) Given
2) $\overline{MO} \cong \overline{QO}$	2) Given
3) $\angle O \cong \angle O$	3) Reflexive Property
4) $\triangle OMP \cong \triangle OQN$	4) ASA Cong. Thm.
5) $\overline{ON} \cong \overline{OP}$	5) CPCTC
6) $mON = mOP$	6) Def'n Cong.
7) $mON + mNm = mOm$	7) Segment Add. Post.

8, mOP + mPQ = mOQ

8) mON + mNm = mOP + mPQ   8) Subst.

9) mNm = mPQ   9) Subtr. Prop.

10) $\overline{MN} \cong \overline{QP}$ | 10) Def'n Cong.