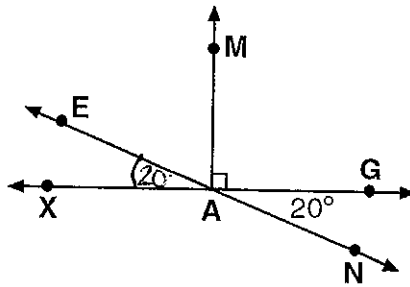


Name: _____

Sum of the interior angles of a triangle, Isosceles triangle theorem, Vertical angles, Complementary and Supplementary angles

- 1) In the diagram below, \overline{XG} and \overline{EN} intersect at A, $\overline{AM} \perp \overline{XG}$, and $m\angle GAN = 20^\circ$.

Find $m\angle EAM$.

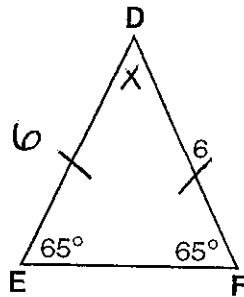
$\angle EAM \cong \angle GAN$ because they are vertical angles

Questions 2 and 3 refer to the following:

Use the information in the figure to state whatever conclusions you can about unmarked sides and angles in the figure.

2)

$$\begin{aligned} x + 65 + 65 &= 180 \\ x + 130 &= 180 \\ x &= 50 \\ \angle EDF &= 50^\circ \end{aligned}$$



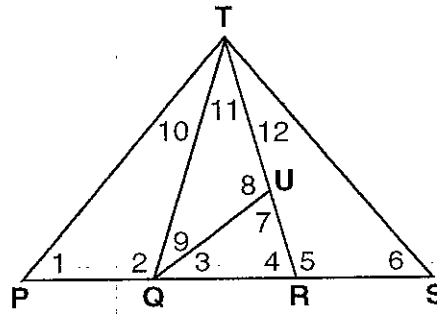
Isosceles Δ
 $\overline{DE} \cong \overline{DF}$



Equilateral/Equianqular
 $x = 60^\circ$

Isosceles Δ s

Questions 4 through 6 refer to the following:



4) If $\overline{TP} \cong \overline{TS}$, which angles are congruent?

A) $\angle 2 \cong \angle 5$

B) $\angle 10 \cong \angle 12$



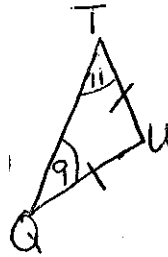
C) $\angle 4 \cong \angle 6$

D) $\angle 1 \cong \angle 6$

5) If $\overline{QU} \cong \overline{TU}$, which angles are congruent?

A) $\angle 3 \cong \angle 12$

B) $\angle 9 \cong \angle 11$



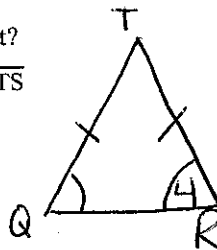
C) $\angle 8 \cong \angle 9$

D) $\angle 8 \cong \angle 11$

6) If $\angle TQR \cong \angle 4$, which segments are congruent?

A) $\overline{TQ} \cong \overline{TR}$

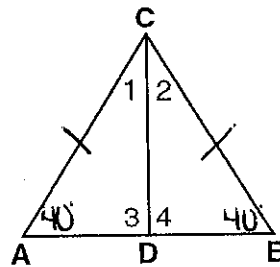
B) $\overline{TP} \cong \overline{TS}$



C) $\overline{PQ} \cong \overline{RS}$

D) $\overline{QU} \cong \overline{QR}$

Questions 7 through 9 refer to the following:



7) In ΔABC , if $\overline{AC} \cong \overline{CB}$ and $m\angle A = 40^\circ$, what is the $m\angle B$?

A) 20°

B) 80°

C) 120°

D) 40°

- 8) In $\triangle ABC$, $\overline{AB} \cong \overline{BC}$. If $m\angle A = (4x + 50)^\circ$, $m\angle B = (2x + 60)^\circ$, and $m\angle C = (14x + 30)^\circ$, find $m\angle A$, $m\angle B$, and $m\angle C$.

\angle s of a \triangle add up to 180°

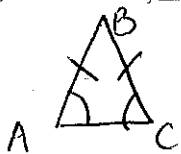
$$4x + 50 + 2x + 60 + 14x + 30 = 180$$

$$20x + 140 = 180$$

$$20x = 40$$

$$x = 2$$

- 9) In $\triangle ABC$, $\angle A \cong \angle C$. If $AB = 2x + 17$ and $BC = 5x - 34$, find the value of x .



$$2x + 17 = 5x - 34$$

$$17 = 3x - 34$$

$$51 = 3x$$

$$17 = x$$

- 10) The measure of an angle and its complement are in the ratio 13:5. Find the measure of the two angles.

$$13x + 5x = 90$$

$$18x = 90$$

$$x = 5$$

$$13(5) = 65$$

$$5(5) = 25$$

- 11) The measures of the angles of a triangle are in the ratio 5:6:7. Find the measure of the largest angle.

$$5x + 6x + 7x = 180$$

$$18x = 180$$

$$x = 10$$

$$7(10) = 70$$

- 12) Two complementary angles have measures in the ratio 5:4. What is the measure of the smaller angle?

A) 100° B) 80° C) 40° D) 50°

$$5x + 4x = 90$$

$$9x = 90$$

$$x = 10$$

$$4(10) = 40$$

- 13) Two supplementary angles have measures in the ratio 2:4. What is the measure of the smaller angle?

A) 60° B) 120° C) 30° D) 50°

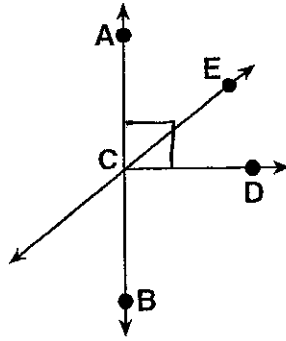
$$2x + 4x = 180$$

$$6x = 180$$

$$x = 30$$

$$2(30) = 60$$

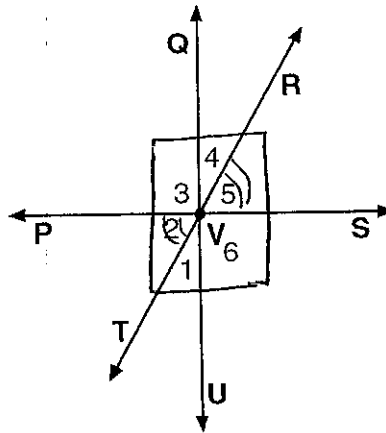
- 14) In the accompanying diagram, \overleftrightarrow{AB} intersects \overleftrightarrow{CE} and $\overleftrightarrow{CD} \perp \overleftrightarrow{AB}$.



Which statement is true?

- A) $\angle ACE$ and $\angle ECD$ are supplementary.
 B) B, C, and D are collinear.
 C) $\angle ACE$ and $\angle ECD$ are complementary.
 D) $\angle ACE \cong \angle BCD$.

- 15) In the diagram below, $\overleftrightarrow{QU} \perp \overleftrightarrow{PS}$.



If $m\angle 2 = (3x + 16)^\circ$ and $m\angle 5 = (4x + 1)^\circ$, find the value of x .

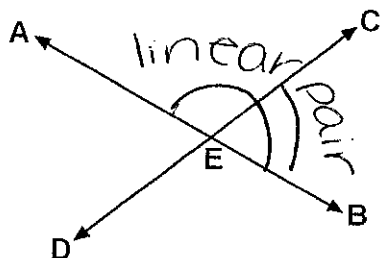
$\angle 2 \cong \angle 5$ because they are vertical \angle s

$$3x + 16 = 4x + 1$$

$$16 = x + 1$$

$$15 = x$$

- 16) In the accompanying diagram, \overleftrightarrow{AB} and \overleftrightarrow{CD} intersect at E.



If $m\angle AEC = (2x + 40)^\circ$ and $m\angle CEB = (x + 20)^\circ$, find x .

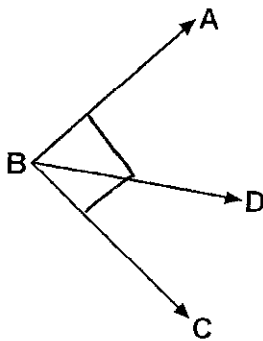
$$2x + 40 + x + 20 = 180$$

$$3x + 60 = 180$$

$$3x = 120$$

$$x = 40$$

- 17) In the accompanying diagram, $\overleftrightarrow{BA} \perp \overleftrightarrow{BC}$, and \overleftrightarrow{BD} is drawn.



If $m\angle ABD = (2x + 18)^\circ$ and $m\angle CBD = (4x - 18)^\circ$, find x .

$$2x + 18 + 4x - 18 = 90$$

$$6x = 90$$

$$x = 15$$

