Name: _____

Homework

Topics: Sum of interior angles of a triangle, isosceles triangle theorem, vertical angles, complemenetary angles, supplementary angles

.) Every equilateral triangle is equiangular.
(TRUE) **FALSE**

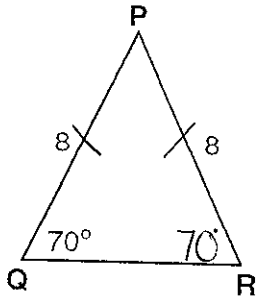
2) Every equiangular triangular is equilateral.
(TRUE) **FALSE**

3) The base angles of an isosceles triangle are congruent. **(TRUE)** **FALSE**

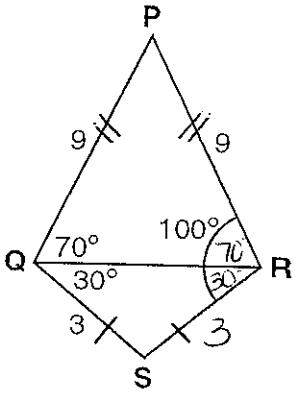
Questions 4 and 5 refer to the following:

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

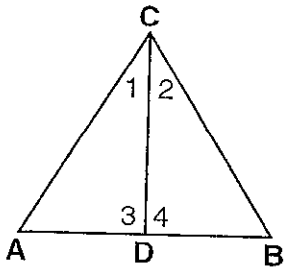
4)



5)



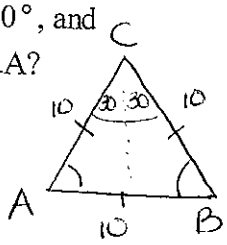
Questions 6 through 8 refer to the following:



6) $\triangle ABC$ is equilateral, $CB = 10$, $m\angle 1 = 30°$, and $\overline{CD}$ is the median to $\overline{AB}$. What is the $m\angle A$?

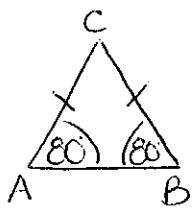
A) 30°
B) 90°
● 60°
D) 45°

$\frac{180}{3} = 60$

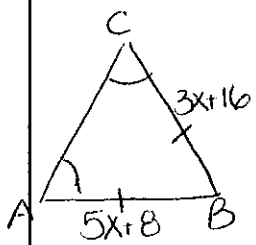


7) In $\triangle ABC$, if $\overline{AC} \cong \overline{CB}$ and $m\angle A = 80°$, what is the $m\angle B$?

● 80°
B) 40°
C) 20°
D) 120°



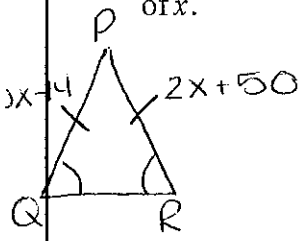
8) In $\triangle ABC$, $\angle A \cong \angle C$. If $AB = 5x + 8$ and $BC = 3x + 16$, find the value of x.



$3x+16 = 5x+8$
$-3x \quad -3x$
$16 = 2x+8$
$-8 \quad -8$
$\frac{8}{2} = \frac{2x}{2}$
$x = 4$

9) In $\triangle PQR$, $\angle Q \cong \angle R$. If $PQ = 10x - 14$, $PR = 2x + 50$, and $RQ = 4x - 30$, find the value of x.

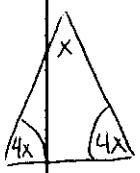
Not Needed



$10x - 14 = 2x + 50$
$-2x \quad -2x$
$8x - 14 = 50$
$+14 \quad +14$
$\frac{8x}{8} = \frac{64}{8}$
$x = 8$

10) The measure of a base angle of an isosceles triangle is 4 times the measure of the vertex angle. The number of degrees in the vertex angle is

A) 36°
B) 30°
● 20°
D) 135°



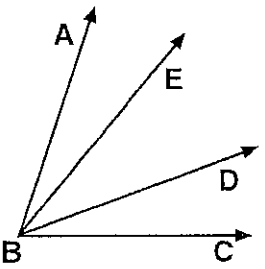
$x + 4x + 4x = 180$
$\frac{9x}{9} = \frac{180}{9}$
$x = 20$

11) Each base angle of an isosceles triangle is 15 more than the vertex angle. What is the measure of the vertex angle?

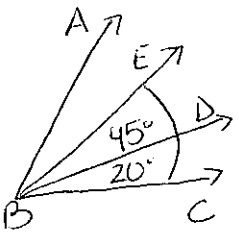
A) 30°
● 50°
C) 70°
D) 55°

$x + x + 15 + x + 15 = 180$
$3x + 30 = 180$
$-30 \quad -30$
$\frac{3x}{3} = \frac{150}{3}$
$x = 50$

Questions 12 and 13 refer to the following:

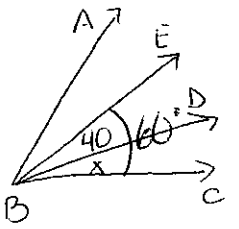


12) If $m\angle CBD = 20°$ and $m\angle DBE = 45°$, find $m\angle EBC$.



$20 + 45 = 65°$

13) If $m\angle EBC = 60°$ and $m\angle EBD = 40°$, find $m\angle DBC$.



$x + 40 = 60$
$-40 \quad -40$
$x = 20°$

14) Two congruent angles are supplementary. The measure of each angle is

A) 60°
B) 180°
C) 45°
● 90°

$x + x = 180$
$\frac{2x}{2} = \frac{180}{2}$
$x = 90$

15) $\angle A$ and $\angle B$ are complementary and the measure of $\angle B$ is 2 more than three times the measure of $\angle A$. Find $m\angle B$.

$\angle A = x$
$\angle B = 2 + 3x$
$2 + 3(22)$
$2 + 66$
$\angle B = 68$

$x + 2 + 3x = 90$
$4x + 2 = 90$
$-2 \quad -2$
$\frac{4x}{4} = \frac{88}{4}$
$x = 22$

16) Two complementary angles have measures in the ratio 2:4. What is the measure of the *larger* angle?

A) 120°
B) 30°
● 60°
D) 80°

$2x + 4x = 90$
$\frac{6x}{6} = \frac{90}{6}$
$x = 15$
$4(15) = 60$

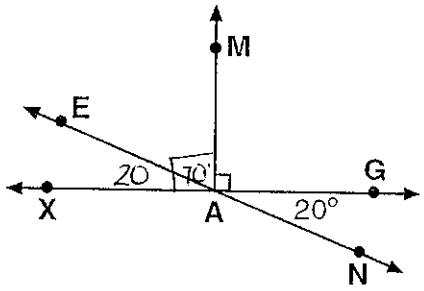
17) The measures of two supplementary angles are in the ratio 2:7. Find the measure of the *smaller* angle.

A) 70°
● 40°
C) 20°
D) 90°

$2x + 7x = 180$
$\frac{9x}{9} = \frac{180}{9}$
$x = 20$
$2(20) = 40$

Questions 18 through 25 refer to the following:

In the diagram below, $\overline{XG}$ and $\overline{EN}$ intersect at A, $\overline{M} \perp \overline{XG}$, and $m\angle GAN = 20°$.



18) Find $m\angle EAX$.

20°

19) Name a pair of vertical angles.

$\angle EAX \cong \angle GAN$

20) Name two right angles.

$\angle MAG$, $\angle MAX$

21) Name a pair of adjacent angles. *next to*

$\angle XAE$ & $\angle EAM$

OR

$\angle EAM$ & $\angle MAG$

OR

$\angle MAG$ & $\angle GAN$

OR

$\angle GAN$ & $\angle NAX$

22) Name an acute angle.

$\angle XAE$ or $\angle EAM$ or $\angle GAN$

23) Name an obtuse angle.

$\angle XAN$

24) Find the measure of the complement of $\angle EAX$.

$x + 20° = 90$

$-20 \quad -20$

$x = 70°$

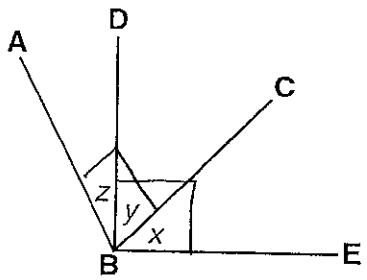
25) Find the measure of the supplement of $\angle EAG$.

$20 + x = 180$

$-20 \quad -20$

$x = 160°$

26) In the accompanying diagram, $\overline{AB} \perp \overline{BC}$, $\overline{DB} \perp \overline{BE}$, $m\angle CBE = x°$, $m\angle DBC = y°$, and $m\angle ABD = z°$.



Which statement must be true?

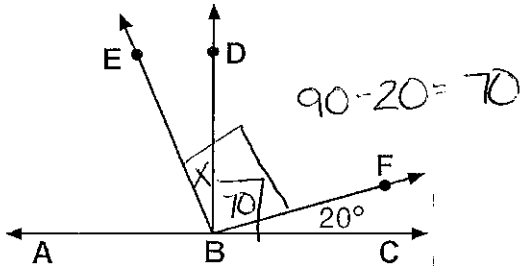
A) $2y = x + z$
B) $x = y$
C) $y = z$
D) $x = z$

$z + y = y + x$

$-y \quad -y$

$z = x$

27) In the accompanying diagram, $\overrightarrow{BD} \perp \overrightarrow{ABC}$ at B and $\overrightarrow{BE} \perp \overrightarrow{BF}$ at B.



90-20=70

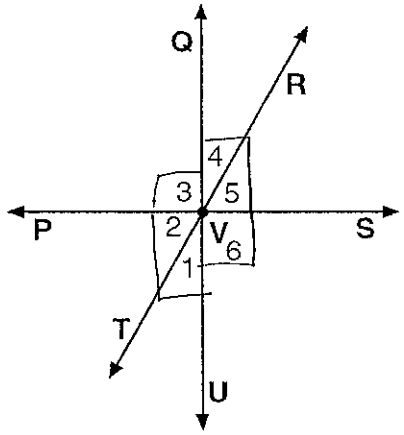
If m∠FBC = 20°, what is m∠EBD?

(1) 20° C) 90°
B) 70° D) 110°

90-70=20

Questions 28 through 30 refer to the following:

In the diagram below, $\overrightarrow{QU} \perp \overrightarrow{PS}$.



28) If m∠1 = 40°, find m∠2.

∠1 + ∠2 = 90
40 + X = 90
-40 -40
X = 50

29) If m∠2 = 60°, find m∠TVQ.

∠2 + ∠3 = ∠TVQ
60 + 90 = ∠TVQ
150° = ∠TVQ

30) If m∠2 = (3x + 16)° and m∠5 = (4x + 1)°, find the value of x.

* vertical angles *
3X+16 = 4X+1
-3X -3X
16 = X + 1
-1 -1
15 = X