

1) Find PR, given that Q is the midpoint of  $\overline{PR}$  and  $PQ = 5$ .

$P \quad 5 \quad Q \quad 5 \quad R$        $\boxed{PR = 10}$

2) Find the value of  $x$  if B is the midpoint of  $\overline{AC}$ ,  $AB = 2x + 9$ , and  $AC = 34$ .

$A \quad 2x+9 \quad B \quad 2x+9 \quad C$

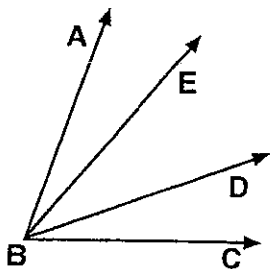
$2x + 9 + 2x + 9 = 34$   
 $4x + 18 = 34$   
 $4x = 16$        $\boxed{x = 4}$

3) Find the value of  $x$  if B is the midpoint of  $\overline{AC}$ ,  $AB = 10 - x$ , and  $BC = 2x + 37$ .

$A \quad 10-x \quad B \quad 2x+37 \quad C$

$10 - x = 2x + 37$   
 $+x \quad +x$   
 $10 = 3x + 37$   
 $-37 \quad -37$   
 $-27 = 3x$   
 $-9 = x$        $\boxed{x = -9}$

Questions 4 and 5 refer to the following:



4) If  $m\angle ABE = 25^\circ$  and  $m\angle DBE = 45^\circ$ , find  $m\angle ABD$ .

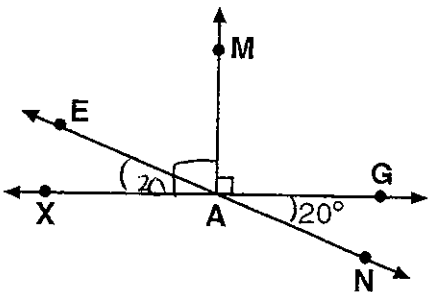
$\angle ABE + \angle DBE = \angle ABD$   
 $25 + 45 = \boxed{65}$

If  $\overline{BE}$  bisects  $\angle ABD$  and  $m\angle ABD = 66^\circ$ , find  $m\angle ABE$ .

$\frac{1}{2}(\angle ABD) = \angle ABE$        $\frac{1}{2}(66) = \boxed{33}$

Questions 6 through 8 refer to the following:

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



6) Find  $m\angle EAM$ .

$20 + x = 90$

$\boxed{x = 70}$

7) Name a pair of vertical angles.

$\angle EAX$  and  $\angle NAG$  or  $\angle EAG$  and  $\angle NAX$

Name a pair of adjacent angles.

$\angle XAE$  and  $\angle EAM$

$\angle EAM$  and  $\angle MAG$

$\angle MAG$  and  $\angle GAN$

$\angle GAN$  and  $\angle NAX$

$\angle NAX$  and  $\angle XAE$

9) Find the measure of the complement of  $3^\circ$ .  $x + 3 = 90$

$-3 \quad -3$   
 $\boxed{x = 87}$

10) Find the measure of the supplement of  $120^\circ$ .

$x + 120 = 180$   
 $-120 \quad -120$        $\boxed{x = 60}$

11)  $\angle 1$  and  $\angle 2$  are supplementary. If  $m\angle 1 = (3x - 17)^\circ$  and

$m\angle 2 = (5x + 21)^\circ$ , find the value of  $x$ .  $3x - 17 + 5x + 21 = 180$

$8x + 4 = 180$   
 $8x = 176$

$\boxed{x = 22}$

12)  $\angle 1$  and  $\angle 2$  are complementary. If  $m\angle 1 = (x + 3)^\circ$  and

$m\angle 2 = (4x - 8)^\circ$ , find the value of  $x$ .  $x + 3 + 4x - 8 = 90$

$5x - 5 = 90$

$5x = 95$

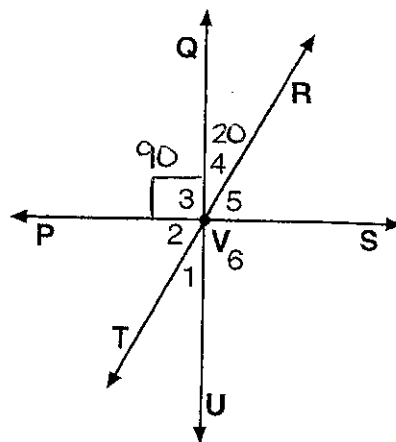
$\boxed{x = 19}$

13) In the accompanying diagram,  $\overline{OA} \perp \overline{OB}$  and  $\overline{OD} \perp \overline{OC}$ .

$\angle 3 + \angle 2 = 90$   
 $39 + \angle 2 = 90$   
 $-39 \quad -39$   
 $\angle 2 = 51$   
 If  $m\angle 3 = 39^\circ$ , what is  $m\angle 1$ ?

$\angle 1 + \angle 2 = 90$   
 $\angle 1 + 51 = 90$   
 $-51 \quad -51$   
 $\boxed{\angle 1 = 39}$

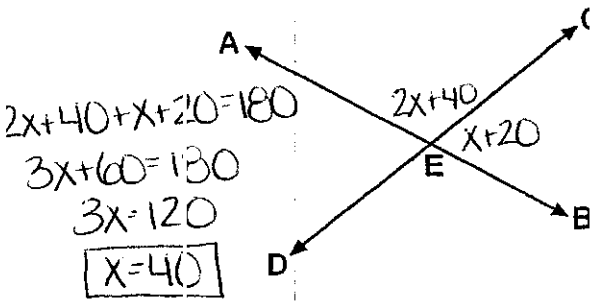
14) In the diagram below,  $\overline{QU} \perp \overline{PS}$ .



If  $m\angle 4 = 20^\circ$ , find  $m\angle PVR$ .

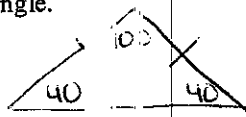
$90 + 20 = \boxed{110}$

15) In the accompanying diagram,  $\overline{AB}$  and  $\overline{CD}$  intersect at E.

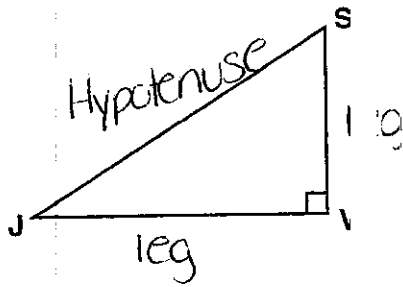


If  $m\angle AEC = (2x + 40)^\circ$  and  $m\angle CEB = (x + 20)^\circ$ , find  $x$ .

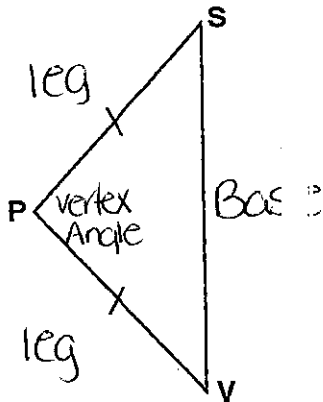
16) Draw an obtuse triangle that is isosceles. Indicate the length of each side and the measure of each angle.



17) Name the legs and the hypotenuse.



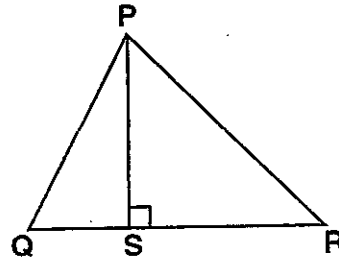
18) Name the legs, the base, and the vertex angle.



Questions 19 through 21 refer to the following:

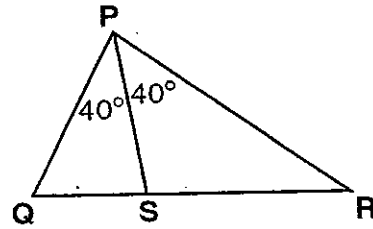
In the given diagram, what type of line segment is  $\overline{PS}$ ?

19)



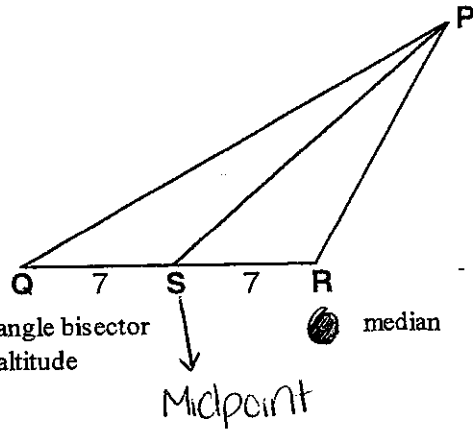
- A) altitude
- B) angle bisector
- C) median

20)



- A) median
- B) angle bisector
- C) altitude

21)



- A) angle bisector
- B) altitude
- C) median