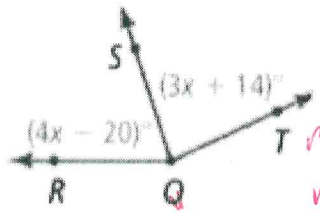
Angle Addition

If $m\angle RQT = 155$, what are $m\angle RQS$ and $m\angle TQS$?



$m\angle RQS + m\angle SQT = m\angle RQT$

$4x-20+3x+14=155$

$7x-6=155$

$+6 \quad +6$

$\frac{7x}{7}=\frac{161}{7}$

$x=23$

$m\angle TQS = 3x+14$

$m\angle TQS = 3(23)+14$

$m\angle TQS = 69+14$

$m\angle TQS = 83$

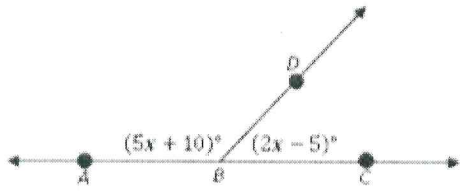
$m\angle RQS = 4x-20$

$m\angle RQS = 4(23)-20$

$m\angle RQS = 92-20$

$m\angle RQS = 72$

Find the measure of angle ABD.



$m\angle ABD + m\angle DBC = 180$

$5x+10+2x-5=180$

$7x+5=180$

$-5 \quad -5$

$7x=175$

$x=25$

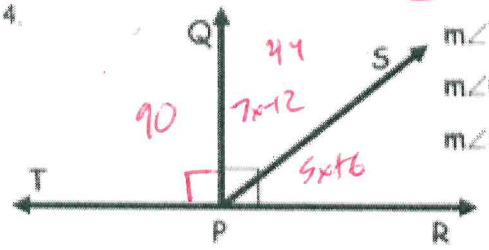
$m\angle ABD = 5x+10$

$m\angle ABD = 5(25)+10$

$m\angle ABD = 125+10$

$m\angle ABD = 135$

4.



m∠TPQ = 90°

m∠QPS = 7x - 12

m∠SPR = 5x + 6

Find the following:

x = 8

m∠QPS = 44

m∠QPR = ~~180~~ 90

m∠TPR = 180

m∠SPR = 46

m∠SPT = 134

$m\angle RPS + m\angle SPQ = 90$

$5x+6+7x-12=90$

$12x-6=90$

$+6 \quad +6$

$\frac{12x}{12}=\frac{96}{12}$

$x=8$

$m\angle QPS = 7x-12$

$m\angle QPS = 7(8)-12$

$m\angle QPS = 56-12$

$m\angle QPS = 44$

$m\angle SPR = 5x+6$

$m\angle SPR = 5(8)+6$

$m\angle SPR = 40+6$

$m\angle SPR = 46$

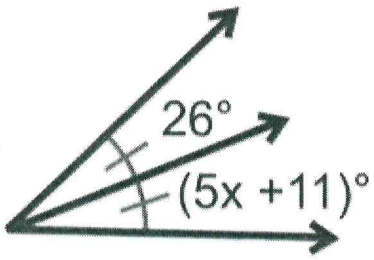
$m\angle SPT = m\angle TPQ + m\angle QPS$

$m\angle SPT = 90+44$

$m\angle SPT = 134$

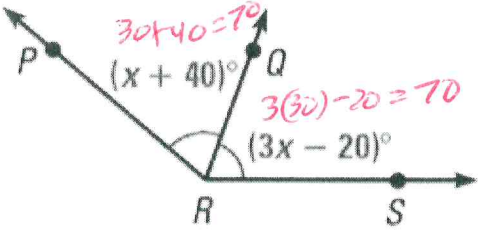
Angle Bisector

Find x



$5x+11=26$
$-11 \quad -11$
$\frac{5x}{5}=\frac{15}{5}$
$x=3$

Find measure of angle PRS

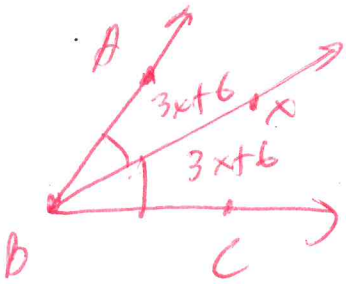


$30+40=70$
$3(30)-20=70$
$m\angle PRS = m\angle PRQ + m\angle QRS$
$m\angle PRS = 70+70 = 140$

$m\angle PRQ = m\angle QRS$
$x+40=3x-20$
$-x \quad -x$
$40=2x-20$
$+20 \quad +20$
$\frac{60}{2}=\frac{2x}{2}$
$30=x$

Ray BX bisects angle ABC

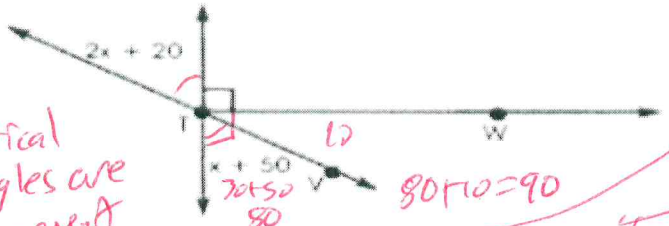
If $m\angle ABC = 4x+16$ and $m\angle CBX = 3x+6$, find the value of x.



Since $\overrightarrow{BX}$ So $\angle ABX \cong \angle XBC$
So $m\angle ABX = m\angle XBC$
So $m\angle ABX = 3x+6$

$m\angle ABX + m\angle XBC = m\angle ABC$
$3x+6+3x+6 = 4x+16$
$6x+12 = 4x+16$
$-4x \quad -4x$
$2x+12 = 16$
$-12 \quad -12$
$\frac{2x}{2}=\frac{4}{2}$
$x=2$

Combination Problems



vertical angles are congruent

$2x+20 = x+50$

$-20 \quad -20$

$2x = x+30$

$-x \quad -x$

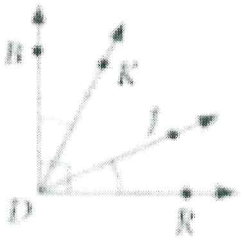
$x = 30$

$80+10=90$

$m\angle VTW = 10$

Solve for x and m $\angle VTW$

Find x

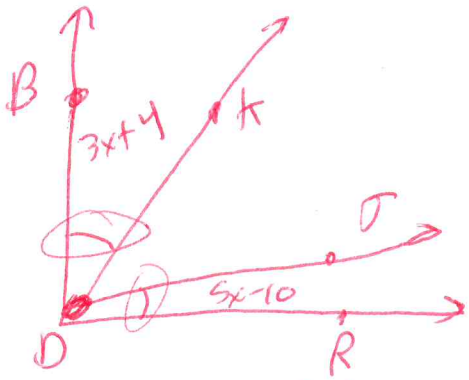


4. $m\angle BDK = 3x + 4, m\angle JDR = 5x - 10$

5. $m\angle BDJ = 7y + 2, m\angle JDR = 2y + 7$

6. m$\angle JDR$= 3x+2
   m$\angle KDJ$= 4x-8

(4)



since $\angle BDK \cong \angle JDR$

$3x+4 = 5x-10$

$-3x \quad -3x$

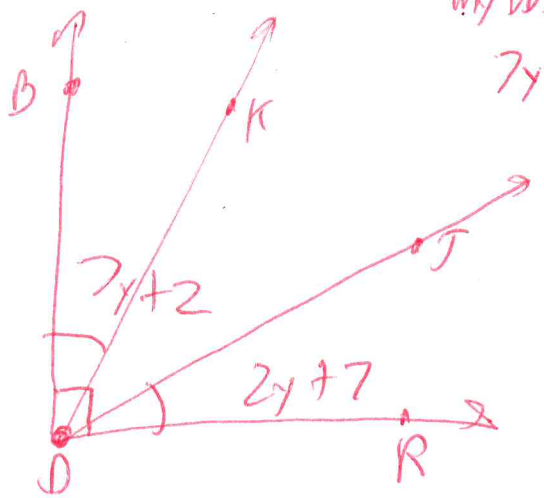
$4 = 2x-10$

$+10 \quad +10$

$\frac{14}{2} = \frac{2x}{2}$

$7 = x$

(5)



$m\angle BDJ + m\angle JDR = 90$

$7y+2+2y+7 = 90$

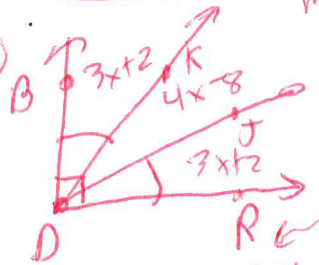
$9y+9 = 90$

$-9 \quad -9$

$\frac{9y}{9} = \frac{81}{9}$

$y = 9$

(6)



since $\angle BDK \cong \angle JDK$

$m\angle BDK = 3x+2$

So $m\angle JDR + m\angle JDK + m\angle KDB = 90$

$3x+2+4x-8+3x+2 = 90$

$10x-4 = 90$

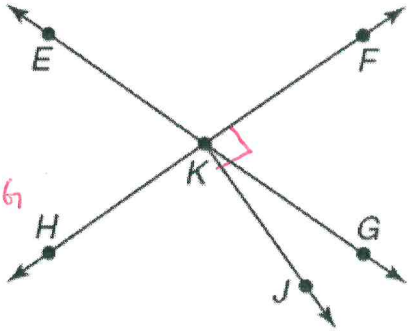
$+4 \quad +4$

$\frac{10x}{10} = \frac{94}{10}$

$x = \frac{94}{10}$

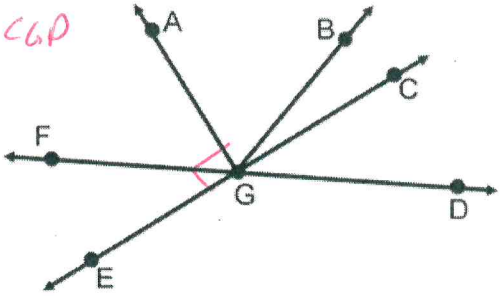
Angle Pairs

For #1-6, use the figure at the right.



1. Name two acute vertical angles. ∠EKA and ∠FKG
2. Name two obtuse vertical angles. ∠EKF and ∠HKG
3. Name a linear pair. ∠BKF and ∠FKG
4. Name two acute adjacent angles. ∠HKJ and ∠JKG
5. Name an angle complementary to $\angle FKG$. ∠GKJ
6. Name an angle supplementary to $\angle FKG$. ∠HKG or ∠EKF

Use the figure at the right to answer each question.



10. Name two acute vertical angles. ∠FGE and ∠CGD
11. Name two obtuse vertical angles. ∠FGC and ∠EGD
12. Name a pair of adjacent angles ∠BGC and ∠CGD
13. Name a linear pair. ∠FGE and ∠EGD
14. Name a pair of complementary angles. ∠BGF and ∠FGA
15. Name an angle supplementary to $\angle FGE$ ∠EGD