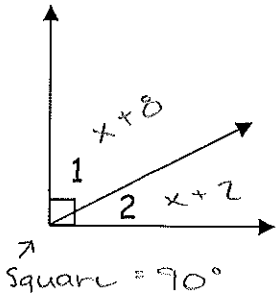
Unit 1, Vocabulary and Algebra
Notes 1-3: Complementary and Supplementary Angles

Name: Aimee Green
Date: 9/4/18 Period:

Complementary Angles - add up to 90°



Ex. 1 In the picture above, m∠1 = x + 8 and m∠2 = x + 2. Find x and m∠2.

$x+8+x+2=90$

$\frac{2x+10=90}{2} \quad -10 \quad -10$

$\frac{80}{2}=40$

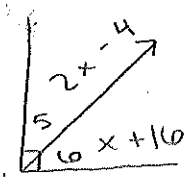
$x=40$

$2=42$

$40+2=42$

→ 90°

Ex. 2 ∠5 is the complement of ∠6. If m∠5 = 2x - 4 and m∠6 = x + 16, find x and m∠6.



$2x-4+x+16$

$3x+12=90$

$-12 \quad -12$

$\frac{78}{3}=x=26$

$x=26$

$6=42°$

$26+16=42$

Notes 2-4 Complementary and Supplementary Angles

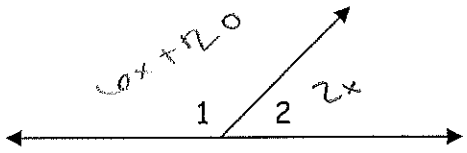
Supplementary Angles -

angles that add up to 180°

Straight line = 180°

Linear Pair -

2 angles that form a Straight line



Ex. 3 In the picture above, m∠1 = 6x + 20 and m∠2 = 2x. Find x and m∠1.

$6x + 20 + 2x = 180$

$8x + 20 = 180$

$-20 \quad -20$

$\frac{8x}{8} = \frac{160}{8}$

$x = 20$

$x = 20$

$1 = 140$

$6(20) + 20$

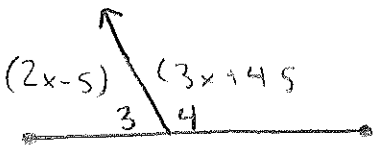
$120 + 20$

140

Ex. 4 ∠3 and ∠4 are a linear pair. m∠3 = 2x - 5 and m∠4 = 3x + 45. Find x and m∠4.

$x = 28°$

$4 = 129°$



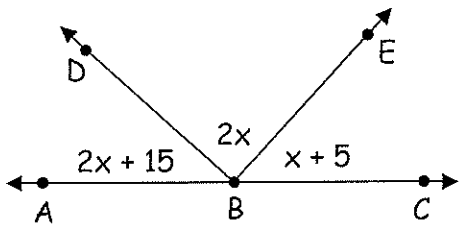
$2x - 5 + 3x + 45 = 180$

$5x + 40 = 180$

$5x = 140$

$x = 28$

Ex 5 In the picture to the right, find x and m∠ ABE.



$2x + 15 + 2x + x + 5 = 180$

$5x + 20 = 180$

$5x = 160$

$x = 32$

$ABE = 143°$

$2(32) + 15 = 79°$

$2(32) = 64° \not> 143$

Geometry

Name: Aimee Green

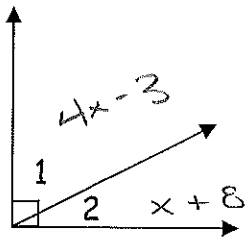
Worksheet 1-3

Date: _____ Period: _____

Use the Four-Step Problem-Solving Procedure for each problem. Write your final answers in the appropriate blank.

Complementary Angles

1. $m\angle 1 = 4x - 3$ and $m\angle 2 = x + 8$. Find x and $m\angle 2$.



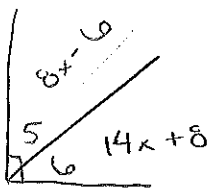
$x = 17$ $\quad x = 15$ $\quad 4x - 3 + x + 8 = 90$

$m\angle 2 = 25$ $\quad (15) + 8 = 23$ $\quad 5x + 5 = 90$

$-5 \quad -5$

$\frac{5x}{5} = \frac{85}{5} = 17$

2. $\angle 5$ is the complement of $\angle 6$. If $m\angle 5 = 8x - 6$ and $m\angle 6 = 14x + 8$, find x and $m\angle 6$.



$8x - 6 + 14x + 8 = 90$

$22x + 2 = 90$

$-2 \quad -2$

$\frac{22x}{22} = \frac{88}{22} = 4$

$14(4) + 8$

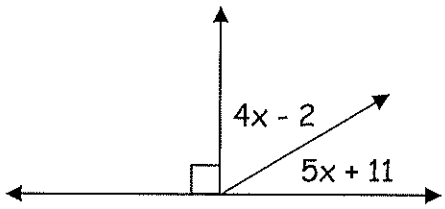
$56 + 8 =$

64

$x = 4$

$m\angle 6 = 64$

3. Find x.



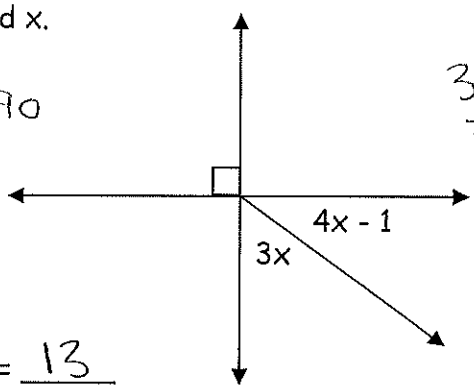
$4x - 2 + 5x + 11 = 90$

$9x + 9 = 90$

$9x = 81$

$x = 9$

4. Find x.



$3x + 4x - 1 = 90$

$7x - 1 = 90$

$+1 \quad +1$

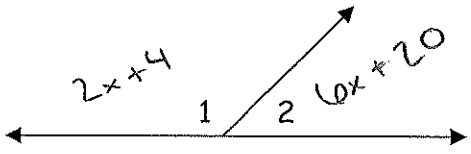
$7x = 91$

$x = 13$

$x = 13$

Supplementary Angles/Linear Pair

5. $m\angle 1 = 2x + 4$ and $m\angle 2 = 6x + 20$. Find x and $m\angle 1$.



$x = 19.5$

$m\angle 1 = 43$

$2x + 4 + 6x + 20 = 180$

$8x + 24 = 180$

$-24 \quad -24$

$8x = 156$

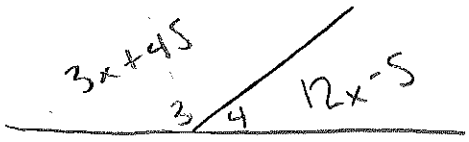
$2(19.5) + 4$

6. $\angle 3$ and $\angle 4$ are a linear pair. $m\angle 3 = 12x - 15$ and $m\angle 4 = 3x + 45$. Find x and $m\angle 4$.

$x = 9.3$

$m\angle 4 = 106.6$

$12(9.3) - 5$



$x = 9.3$

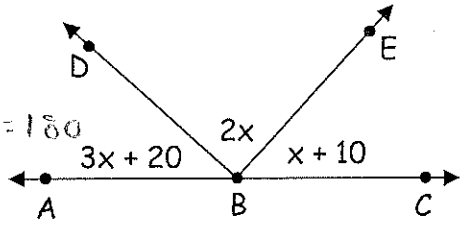
$3x + 45 + 12x - 5 = 180$

$15x + 40 = 180$

$-40 \quad -40$

$15x = 140$

7. In the picture to the right, find x and m∠ABE.



x = 25

m∠ABE = 145

$3x + 20 + 2x + x + 10 = 180$

$6x + 30 = 180$

$-30 \quad -30$

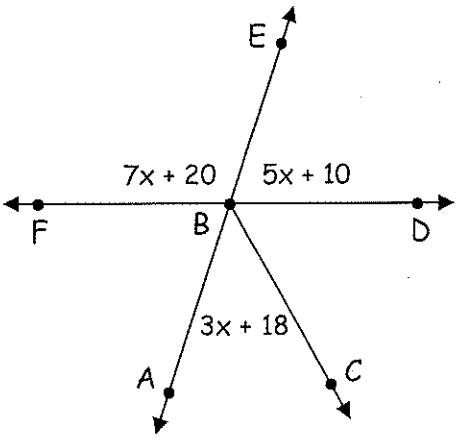
$6x = 150$

$x = 25$

$180 - 35 = 145$

$25 + 10 = 35$

8. In the picture to the right, find x and m∠ABC.



x = 12.5

m∠ABC = 55.5

$3(54) + 18$

$12x + 30 = 180$

$-30 \quad -30$

$12x + 150$

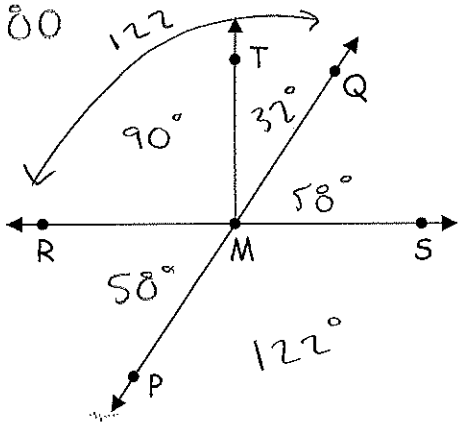
$3x + 18 = 180$

$-18 \quad 18$

$7x + 20 + 5x + 10 = 180$

$12x + 30 = 180$

9. $\overrightarrow{TM} \perp \overleftrightarrow{RS}$, m∠QMS = 58°. Find the measure of each angle.



a) m∠TMQ = 32°

b) m∠RMP = 58°

c) m∠SMP = 122°

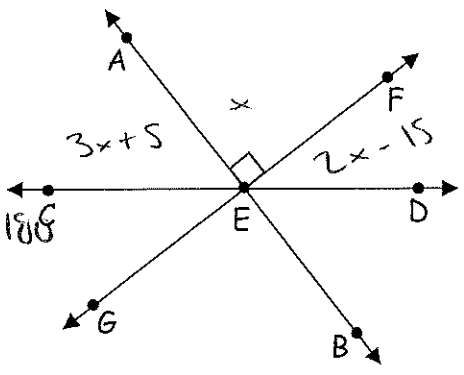
d) m∠PMT = 148

$180 - 58 = 122$

$90 - 58$

$58 + 90 = 148$

10. m∠AEC = 3x + 5 and m∠DEF = 2x − 15. Find m∠DEF, m∠DEB, and m∠CEB.



m∠DEF = 25°

m∠DEB = 65°

m∠CEB = 115°

$3x + 5 + x + 2x - 15 = 180$

$6x - 10 = 180$

$+10 \quad +10$

$6x = 190$