Teaching Notes for Algebra I
Homework #6

Overview: In this lesson, students will learn how to apply algebra concepts to basic geometry concepts and will use their translate and simply skills to solve word problems.

Preparation: Watch videos on "math god" and "translate and simplify."

Classroom Examples:

1) Complimentary angles where one is $3x+7$ and the other is $4x-8$.

$(3x+7)+(4x-8)=90$

$7x-1=90$

$7x=91$

$x=13$

$3x+7$	$4x-8$
$3(13)+7$	$4(13)-8$
$39+7$	$52-8$
46	44

2) Supplementary angles where one is $5x-3$ and the other is $2x+8$.

$(5x-3)+(2x+8)=180$

$7x+5=180$

$7x=175$

$x=25$

$5x-3$	$2x+8$
$5(25)-3$	$2(25)+8$
$125-3$	$50+8$
122	58

3) Vertical angles where one is $7x-9$ and the other is $3x+7$.

$7x-9=3x+7$

$4x-9=7$

$4x=16$

$x=4$

$7x-9$	$3x+7$
$7(4)-9$	$3(4)+7$
$28-9$	$12+7$
19	19

4) Five full circle angles where each one is $3x+2$, $4x$, $5x-6$, $x+5$, and, $2x-1$.

$(3x+2)+(4x)+(5x-6)+(x+5)+(2x-1)=360$

$15x=360$

$x=24$

$3x+2$	$4x$	$5x-6$	$x+5$	$2x-1$
$3(24)+2$	$4(24)$	$5(24)-6$	$24+5$	$2(24)-1$
$72+2$	96	$120-6$	29	$48-1$
74		114		47

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5) Five more than triple the difference of a number and four is seven less than the number.

$3(x-4)+5=x-7$

$3x-12+5=x-7$

$3x-8=x-7$

$2x-8=-7$

$2x=1$

$x=\frac{1}{2}$

6) Eight less than the quotient of a number and four is nine more than twice the number.

$\frac{x}{4}-8=2x+9$

$-8=\frac{9x}{4}+9$

$-17=\frac{9x}{4}$

$68=9x$

$\frac{68}{9}=x$

7) If twice the sum of three consecutive integers is 312, find the three integers.

1st	2nd	3rd
x	$x+1$	$x+2$

$2\left(x+\left(x+1\right)+\left(x+2\right)\right)=312$

$2\left(x+x+1+x+2\right)=312$

$2(3x+3)=312$

$6x+6=312$

$6x=318$

$x=53$

53,54,55

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8) If seven less than triple the sum of the first and third of three consecutive even integers is thirty-seven more than five times the middle integer, find the three integers.

1st	2nd	3rd
x	$x+2$	$x+4$

$3\left(x+\left(x+4\right)\right)-7=5\left(x+2\right)+37$

$3\left(x+x+4\right)-7=5\left(x+2\right)+37$

$3\left(2x+4\right)-7=5\left(x+2\right)+37$

$6x+12-7=5x+10+37$

$6x+5=5x+47$

$x+5=47$

$x=42$

$42,44,46$

9) If three less than double the sum of three consecutive odd integers is two hundred nineteen, find the three integers.

1st	2nd	3rd
x	$x+2$	$x+4$

$2\left(x+\left(x+2\right)+\left(x+4\right)\right)-3=219$

$2\left(x+x+2+x+4\right)-3=219$

$2\left(3x+6\right)-3=219$

$6x+12-3=219$

$6x+9=219$

$6x=210$

$x=35$

$35,37,39$

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10) The sum of two numbers is 42. If five more than triple the smaller is nine less than twice the larger, find the two numbers.

Large	Small
x	$42-x$

$3(42-x)+5=2(x)-9$

$126-3x+5=2x-9$

$131-3x=2x-9$

$131=5x-9$

$140=5x$

$28=x$

28,14

11) The difference of two numbers is seven. If two less than the sum of the two numbers is one more than triple the smaller, find the two numbers.

Large	Small
x	$x-7$

$(x+(x-7))-2=3(x-7)+1$

$x+x-7-2=3x-21+1$

$2x-9=3x-20$

$-9=x-20$

$11=x$

11,4