

# Math 107

## Fall 2016

### Lecture 11

Find two consecutive odd integers such that the sum of 3 times the smaller one and 2 times the larger one is 89.

$x$    &    $x+2$   
 ↑     ↑  
 Smaller   Larger

17 & 19

$$3 \cdot \text{Smaller} + 2 \cdot \text{Larger} = 89$$

$$3x + 2(x+2) = 89$$

$$3x + 2x + 4 = 89$$

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

$$x = 17$$

$$5x + 4 = 89$$

$$5x = 89 - 4$$

$$5x = 85$$

Find two consecutive even integers such that the difference between 5 times the smaller and 3 times the larger one is equal to 18 more than the smaller one.

$x$  &  $x+2$   
 $\uparrow$        $\uparrow$   
 Smaller    Larger

24 & 26

$$5 \cdot \text{Smaller} - 3 \cdot \text{Larger} = \text{Smaller} + 18$$

$$5x - 3(x+2) = x + 18$$

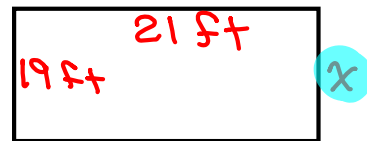
$$5x - 3x - 6 = x + 18$$

$$2x - 6 = x + 18$$

$$x = 24 \quad \leftarrow \quad 2x - x = 18 + 6$$

A rectangular room has a perimeter of 80 ft. Length & width are two consecutive odd integers. Find its dimensions.

19 ft by 21 ft



$x+2$

$$P = 80$$

$$2L + 2W = 80$$

$$2(x+2) + 2(x) = 80$$

$$2x + 4 + 2x = 80$$

$$4x + 4 = 80$$

$$4x = 80 - 4$$

$$4x = 76$$

$$x = \frac{76}{4}$$

$$x = 19$$

## Ch. 8 Money:

Maria has \$1.85  
in Nickels and Dimes  
only.

# of dimes is 1 more  
than twice # of nickels.  
How many of each?

(How many)(Worth) = Value

$$25x = 185 - 10$$

$$25x = 175$$

$$x = 175/25$$

$$x = 7$$

7 Nickels  
&  
15 Dimes

Type	Worth	how many
Nickels	5¢	$x$
Dimes	10¢	$2x + 1$

Total Value 185¢

$$\begin{array}{|l|} \hline \text{Value} \\ \text{in Nickels} \\ \hline \end{array} + \begin{array}{|l|} \hline \text{Value} \\ \text{in Dimes} \\ \hline \end{array} = 185$$

$$5x + 10(2x + 1) = 185$$

$$5x + 20x + 10 = 185$$

$$25x + 10 = 185$$

Jose has \$4.55 in dimes and Quarters only.

The # of Quarters is 1 fewer than twice # of  
dimes. How many quarters does he have?

Type	Worth	How many
Dimes	10¢	$x$
Quarters	25¢	$2x - 1$

$$2(8) - 1$$

$$= 16 - 1$$

$$= 15$$

15 Quarters

$$\begin{array}{|l|} \hline \text{Value} \\ \text{in Dimes} \\ \hline \end{array} + \begin{array}{|l|} \hline \text{Value} \\ \text{in Quarters} \\ \hline \end{array} = \text{Total Value}$$

$$10x + 25(2x - 1) = 455$$

$$10x + 50x - 25 = 455$$

$$60x = 455 + 25$$

$$60x = 480$$

$$x = \frac{480}{60} \quad x = 8$$

PTA paid \$172 for tkts to go to Zoo.

Kid's tkt  $\rightarrow$  \$4, Adult's tkt  $\rightarrow$  \$12

# of kids was 1 more than 4 times # of adults.

How many of each?

Total Value = 172

Type	Worth	How many	Value
Adults	\$12	$x$	$12x$
Kids	\$4	$4x+1$	$4(4x+1)$

$$12x + 4(4x+1) = 172$$

$$12x + 16x + 4 = 172$$

$$28x = 172 - 4$$

$$28x = 168$$

$$x = \frac{168}{28}$$

$$x = 6$$

6 Adults  
&  
25 kids

Sonia bought two types of stamps.

35¢ & 29¢ stamps.

She paid \$3.90.

# of cheaper stamps was 2 fewer than # of more expensive stamp.

How many of each?

Total Value = 390¢

Type	Worth	How many	Value
Cheaper	29¢	$x-2$	$29(x-2)$
Expensive	35¢	$x$	$35x$

$$29(x-2) + 35x = 390$$

$$29x - 58 + 35x = 390$$

$$64x = 390 + 58$$

$$64x = 448$$

$$x = \frac{448}{64}$$

$$x = 7$$

7 stamps  
@ 35¢  
each and  
5 stamps @  
29¢