Math 115

Fall 2017

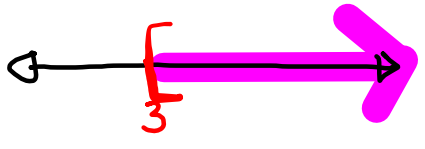
Lecture 7

Class Quiz

① Solve & Graph: $-3x+8 \leq 2x-7$

$-3x-2x \leq -7-8$

$-5x \leq -15$ → $x \geq 3$



② Solve $\frac{2x+3}{5x-1} = \frac{2}{5}$

Cross-Multiply

$5(2x+3) = 2(5x-1)$

$10x+15 = 10x-2$

$10x-10x = -2-15$

$0 = -17$ $\emptyset$

No Soln.

③ 2% of what number is 14?

$\frac{P}{100} = \frac{\text{Part}}{\text{whole}}$ $\frac{2}{100} = \frac{14}{x}$

$2x = 100(14)$

$x = \frac{100(14)}{2}$

$x = 700$

2% of 700 is 14

Translation with inequalities

is less than	$<$
is more than	$>$
is at most	$\leq$
is at least	$\geq$
exceeds	$>$

twice Some number is less than 5 more than the number.

$2x < x + 5$

Twice the Sum of Some number and 8 is at least reduced by 3 is at least 13.

$2(x+8)-3 \geq 13$

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3 times the difference of Some number and 2 increased by 12 is at most 100.

$3(x-2)+12 \leq 100$

twice Some number increased by 7 exceeds 5 times the number reduced by 8.

Find all Such numbers.

$2x+7 > 5x-8$

$2x-5x > -8-7$

$-3x > -15$

$x < 5$ $(-\infty, 5)$

The sum of twice some number and -10 is at most 10 more than four times the number. Find all such numbers.

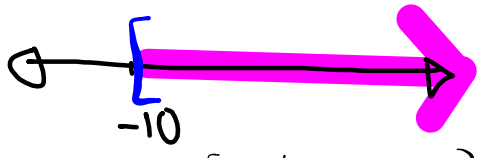
$$2x + (-10) \leq 4x + 10$$

$$2x - 10 \leq 4x + 10$$

$$2x - 4x \leq 10 + 10$$

$$-2x \leq 20$$

$$x \geq -10$$



S.B.N. $\{x \mid x \geq -10\}$

I.N. $[-10, \infty)$

all numbers that are at least -10.

Solve: $-7 < 2x - 3 \leq 17$

$$-7 + 3 < 2x \leq 17 + 3$$

$$-4 < 2x \leq 20$$

$$-2 < x \leq 10$$

S.B.N. $\{x \mid -2 < x \leq 10\}$ I.N. $(-2, 10]$

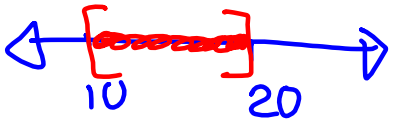
5 more than 3 times some number is at least 35 and at most 65.

Find all such numbers.

$$35 \leq 3x+5 \leq 65$$

$$30 \leq 3x \leq 60$$

$$10 \leq x \leq 20$$



S.B.N. $\{x \mid 10 \leq x \leq 20\}$

I.N. $[10, 20]$

Mary paid at most $135 to a handyman to do some repairs.

Hourly cost was $20, with $35 to show up for the job.

How many hours for the job?

$$20H + 35 \leq 135$$

$$20H \leq 100$$

$$H \leq 5$$

at most 5 hrs

John has $100, and he needs to rent a truck to do some deliveries.
Daily rate is $20. Mileage is 25¢/Mile.
Ignore money for gas.
How many miles in total can he drive in one day?

Total cost ≤ 100

$20 + .25M \leq 100$

$.25M \leq 100 - 20$

$.25M \leq 80$

$M \leq \frac{80}{.25}$ $\quad M \leq 320$

at most 320 miles

Lisa got 82 and 88 on first two exams.
Final exam counts as two tests.
In order to get an A, her average must be at least 90.

Average ≥ 90

What score on the final exam does she need to get an A?

$\text{Average} = \frac{\text{Total pts}}{\text{\# of exams}}$

$\frac{82 + 88 + 2F}{4} \geq 90$ $\quad$ LCD = 4

$\frac{170 + 2F}{4} \geq 90$

$170 + 2F \geq 360$

$2F \geq 190$ $\quad F \geq 95$

She needs at least 95 on the final exam.

B of A offers two plans for checking

Plan A → \$5 monthly fee, 10¢ per check.

Plan B → \$10 monthly fee, 5¢ per check.

Find the number of checks written monthly that makes plan B a better choice.

Cost for Plan B < Cost for plan A

$10 + .05C < 5 + .10C$

$.05C - .10C < 5 - 10$

$-.05C < -5$

$C > 100$

more than 100 checks per month.

Solve $-12 \leq 9 - 3x < 30$

$-12 \leq -3x + 9 < 30$

Subtract 9

$-21 \leq -3x < 21$

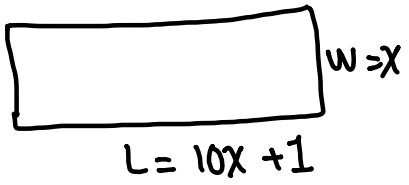
Divide by -3

$7 \geq x > -7 \Rightarrow -7 < x \leq 7$

S.B.N. $\{x \mid -7 < x \leq 7\}$

I.N. $(-7, 7]$

The perimeter of a rectangular garden is 46 ft.
The length is 1 ft longer than 10 times its width.
Find its dimensions.



$P = 46$

$2L + 2W = 46$

$2(10x+1) + 2(x) = 46$

$20x + 2 + 2x = 46$

$22x = 44$

$x = \frac{44}{22}$ $\quad x = 2$

2 ft by 21 ft

A rectangular room has a perimeter of 66 meters.
The length of the room is 3 m shorter than twice its width.
Find its length.

$P = 66$

$2L + 2W = 66$

$2(2x-3) + 2(x) = 66$

$4x - 6 + 2x = 66$

$6x = 72$

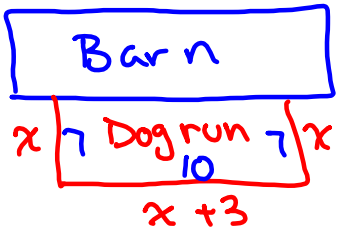
$x = 12$

$L = 2(12) - 3$

$= 21$

21 meters

Mr. Castro wants to build a dog run by the side of his barn. He has 24 ft of fencing. He wants the side along the barn to be 3 ft longer than the sides perpendicular to the barn. Help him find the dimension.



$x + x+3 + x = 24$

$3x + 3 = 24$

$3x = 21$

$x = 7$

7 ft by 10 ft.

Consecutive integers:

1, 2, 3, 4, - - - - - -

97, 98, 99, - - - - -

-9, -8, -7, -6, - - - -

x, $x+1$, $x+2$, $x+3$

Find two consecutive integers such that their sum is 51.

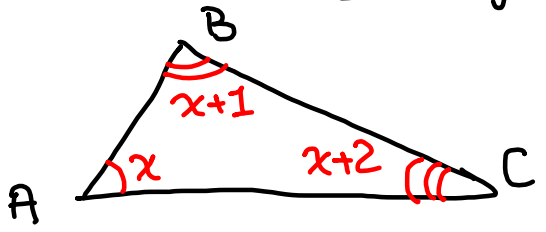
$x + x+1 = 51$

$2x = 50$

$x = 25$

25 & 26

In triangle ABC, measures of three angles are three consecutive integers. Find all three.



$A + B + C = 180^\circ$

$x + x+1 + x+2 = 180$

$3x + 3 = 180$

$3x = 177$

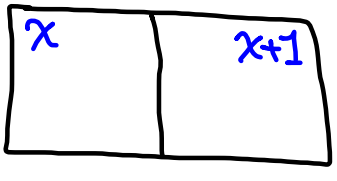
$x = 59$

$59^\circ, 60^\circ, 61^\circ$

Rowen asked Charlie what page of the book he was reading.

Charlie said the sum of page numbers that he was facing was 463.

What page numbers was Charlie looking at?



$x + x+1 = 463$

$2x = 462$

$x = 231$

Charlie was looking at page 231 & 232.

Consecutive Even Integers

2, 4, 6, ------

90, 92, 94, -----

188, 190, 192, ----

-30, -28, -26, -----

x , $x+2$, $x+4$, $x+6$

It has to be even.

Find two consecutive even integers such that their total is 100.

x & $x+2$

$x + x + 2 = 100$

$2x + 2 = 100$

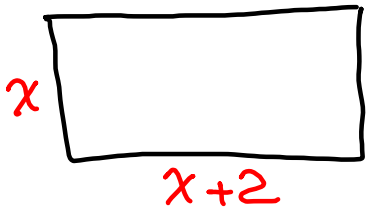
$2x = 98$

$x = 49$

NO Solution

It has to be even.

Length and width of a rectangular pool are two cons. even integers. The Perimeter is 100 ft. Find its dimensions.



$P = 100$

$2L + 2W = 100$

$2(x+2) + 2(x) = 100$

$2x + 4 + 2x = 100$

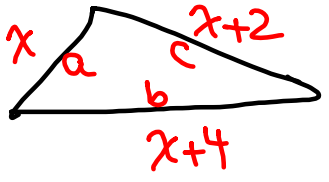
$4x + 4 = 100$

$4x = 96$

$x = 24$

24 ft by 26 ft

Ana has a triangular table. Three sides are three cons. even integers. Perimeter is 24 ft. Find all three sides.



$P = 24$

$a + b + c = 24$

$x + x+4 + x+2 = 24$

$3x + 6 = 24$

$3x = 18$

$x = 6$

6 ft, 8 ft, and 10 ft

Work on SG 5

Due Monday SG 6

Exam I at 9:00 AM.

You may come early to have extra time. CALC. ok but no Cellphone.