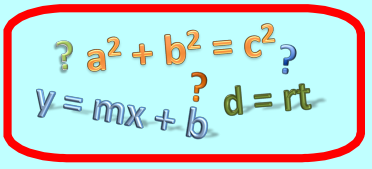
Math 115

Fall 2018

Lecture 7



Feb 19-8:47 AM

Solve

$3x - 8 \leq 5x + 12$

$3x - 5x \leq 12 + 8$

$-2x \leq 20$

Divide by -2

$\frac{-2}{-2}x \geq \frac{20}{-2}$

$x \geq -10$

Set-builder notation

$\{x \mid x \geq -10\}$

Such that

Graph

Interval notation

$[-10, \infty)$

Oct 31-6:04 AM

Solve

$2x + 24 > 4(x-2) + 6$

$2x + 24 > 4x - 8 + 6$

$2x + 24 > 4x - 2$

$2x - 4x > -2 - 24$

$-2x > -26$

Divide by -2

$\frac{-2}{-2}x < \frac{-26}{-2}$

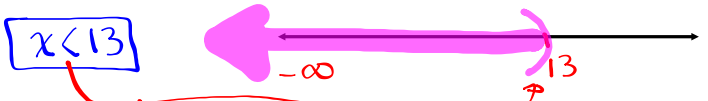
$x < 13$

① S.B.N.

$\{x \mid x < 13\}$

such that

② Graph



③ Interval notation

$(-\infty, 13)$

Oct 31-6:09 AM

Solve, express your final answer in 3 methods.

$\frac{3}{4}x - \frac{7}{10} \geq \frac{4}{5}x + \frac{1}{2}$

Hint: multiply by LCD to clear fractions

LCD = 20

$20 \cdot \frac{3}{4}x - 20 \cdot \frac{7}{10} \geq 20 \cdot \frac{4}{5}x + 20 \cdot \frac{1}{2}$

$15x - 14 \geq 16x + 10$

$15x - 16x \geq 10 + 14$

$-x \geq 24$

$-1x \geq 24$

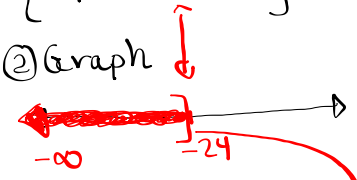
$\frac{-1}{-1}x \leq \frac{24}{-1}$

$x \leq -24$

① S.B.N.

$\{x \mid x \leq -24\}$

② Graph



③ Interval notation

$(-\infty, -24]$

Oct 31-6:16 AM

Solve $-7 < 2x+1 \leq 7$

$-7-1 < 2x+1-1 \leq 7-1$

$-8 < 2x \leq 6$

$\frac{-8}{2} < \frac{2}{2}x \leq \frac{6}{2}$

$-4 < x \leq 3$

① S.B.N.

$\{x \mid -4 < x \leq 3\}$

② Graph

③ I.N. $(-4, 3]$

Larger on Right

Smaller on Left

Oct 31-6:26 AM

Solve $-5 < -3x - 5 \leq 4$

$-5+5 < -3x-5+5 \leq 4+5$

$0 < -3x \leq 9$

Divide by -3

$\frac{0}{-3} > \frac{-3}{-3}x \geq \frac{9}{-3}$

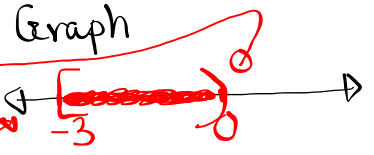
$0 > x \geq -3$

① S.B.N.

$\{x \mid 0 > x \geq -3\}$ ✓

$\{x \mid -3 \leq x < 0\}$ ✓

② Graph



③ I.N. $[-3, 0)$

Oct 31-6:32 AM

The difference of 10 and twice some number exceeds 20. Find all such numbers.

Let x be such number,

$10 - 2x > 20$

$-2x > 20 - 10$

$-2x > 10$

$\frac{-2}{-2}x < \frac{10}{-2}$

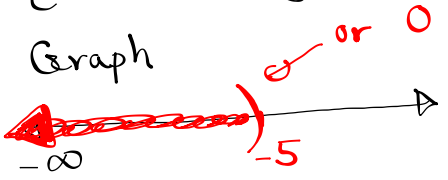
$x < -5$

All numbers less than -5.

S.B.N.

$\{x \mid x < -5\}$

Graph



I.N.

$(-\infty, -5)$

Oct 31-6:53 AM

The sum of 4 times a number and 3 is greater than -5 and is atmost 3. ($\leq$)

Find all such numbers.

Let x be such number,

$-5 < 4x + 3 \leq 3$

Subtract 3

$-8 < 4x \leq 0$

Divide by 4

$-2 < x \leq 0$

All numbers between -2 and 0, including 0.

S.B.N.

$\{x \mid -2 < x \leq 0\}$

Graph

I.N. $(-2, 0]$

Oct 31-6:58 AM

Raul got 84 on exam 1, and 88 on exam 2. Final exam counts as 2 exams. What score on final exam makes his average to be at least 90 so he can get an A for the class.

Exams are out of 100 pts.

$$\frac{84+88+2F}{4} \geq 90$$

$$\frac{172+2F}{4} \geq 90$$

multiply by 4

He must score at least 94.

Graph: 

I.N. $[94, 100]$

Average ≥ 90

$$\frac{\text{Total Scores}}{\#\text{ of exams}} \geq 90$$

$172 + 2F \geq 360$

$2F \geq 360 - 172$

$2F \geq 188$

$F \geq \frac{188}{2}$

$\boxed{F \geq 94}$

Oct 31-7:07 AM

Solve for y: $5x - 4y + 3 < -2x + y - 7$

$-4y - y < -2x - 7 - 5x - 3$

$-5y < -7x - 10$

Divide by -5

$\frac{-5}{-5}y > \frac{-7}{-5}x - \frac{10}{-5}$

$\boxed{y > \frac{7}{5}x + 2}$

Oct 31-7:17 AM

The sum of two numbers is 23.

One of them is 5 more than twice the other one. Find both numbers.

Let x be one of the numbers,

x, $2x+5$

$x + 2x + 5 = 23$

$3x + 5 = 23$

$3x = 23 - 5$

$3x = 18$

$x = \frac{18}{3}$ $\quad x = 6$

6 & 17

Oct 31-7:42 AM

The sum of two numbers is 32.

One of them is 3 less than 4 times the other one.

Find the larger number.

Let x be one of the numbers,

x, $4x - 3$

7, $4(7) - 3 = 25$

$x + 4x - 3 = 32$

$5x - 3 = 32$

$5x = 35$

$x = 7$

the larger number is 25.

Oct 31-7:46 AM

Marisol ordered 110 boxes of markers. They were in blue or red colors. The # of blue color markers was 8 more than 5 times the # of red color markers. How many of each did she order?

Total = 110

Parts: Red & Blue

Blue = 5·Red + 8

Red → x

Blue → $5x+8$

$x + 5x + 8 = 110$

$6x = 102$

$x = 17$

$5(17)+8 = 93$

17 Red boxes & 93 Blue boxes

Oct 31-7:51 AM

School purchased 47 tickets for a field trip to the Zoo. Kids + Adults = 47

The number of kids was 1 fewer than 3 times the number of adults. Kids = 3·adults − 1

① How many of each? ✓

② Find the total cost if adult's tkt was $8 each and kid's tkt was $3 each.

Adults → x

Kids → $3x-1$

$x + 3x - 1 = 47$

$4x = 48$

$x = 12$

12 adults & 35 kids

Total Cost = $12(8) + 35(3) = 201$ ⇒ Total Cost $201

Work on WP ch. 4

Oct 31-7:59 AM

I must have SG 1 - SG4 AND WP 1 - WP4 by no later than 6:00 AM on Thursday. NOV. 1, 2018

Consecutive integers

1, 2, 3, 4, ...

27, 28, 29, ...

−16, −15, −14, −13, ...

105, 106, 107, 108, ...

$x, x+1, x+2, x+3, \ldots$ x must be an integer.

Oct 31-8:21 AM

The sum of two consecutive integers is 47.

Find both such integers.

$x, x+1$

$x + x+1 = 47$

$2x + 1 = 47$

$2x = 46$

$x = \frac{46}{2}$ $\boxed{x = 23}$

$\boxed{23 \text{ & } 24}$

Oct 31-8:25 AM

Find two consecutive integers such that The sum of twice the smaller one and fives the larger one is 222.

x & $x+1$

$2 \cdot \text{Smaller} + 5 \cdot \text{larger} = 222$

$2x + 5(x+1) = 222$

$2x + 5x + 5 = 222$

$7x = 217$

$x = 31$

31 & 32

Oct 31-8:27 AM

Find two cons. integers such that the difference of 3 times the smaller one and 6 times the larger one is equal to -141.

$3 \cdot \text{Smaller} - 6 \cdot \text{larger} = -141$

x & $x+1$

$3 \cdot x - 6(x+1) = -141$

$3x - 6x - 6 = -141$

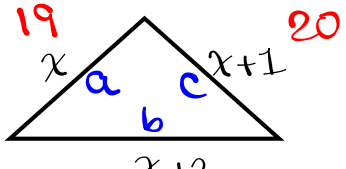
$-3x = -135$

$x = 45$

45 & 46

Oct 31-8:33 AM

Perimeter of a triangular shape is 60 ft. 3 sides are 3 cons. integers. Find the largest side.



$P = 60$

$a + b + c = 60$

$x + x+2 + x+1 = 60$

$3x + 3 = 60$

$3x = 57$

$x = 19$

21 ft

Oct 31-8:37 AM

Consecutive even integers

2, 4, 6, 8, ---

30, 32, 34, 36, ...

−16, −14, −12, −10, ----

$x, x+2, x+4, x+6, \ldots$ x must be even

Find two consecutive even integers with the sum of 50.

x & $x+2$

$x + x+2 = 50$

$2x = 48$

$x = 24$

24 & 26

Oct 31-8:40 AM

Find two consecutive even integers with the sum of 100.

x & $x+2$

$x + x + 2 = 100$

$2x = 98$

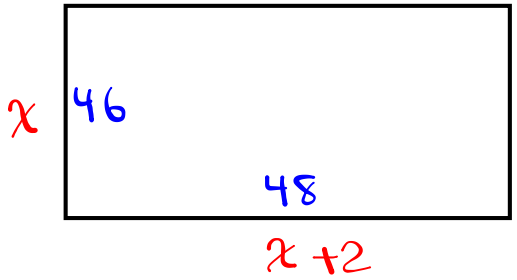
$x = 49$ Not even

NO such even integers

Oct 31-8:44 AM

The perimeter of a rectangular garden is 188 meters.

Its dimensions are two consecutive even integers. Find its length.



$P = 188$ m

$2L + 2W = 188$

$2(x+2) + 2(x) = 188$

$2x + 4 + 2x = 188$

$4x = 184$

$x = 46$ ✓

length is 48m.

Oct 31-8:47 AM

Find two consecutive even integers such that

5 times the larger one | is | 116 more than 3 times the smaller one.

x & $x+2$

$5 \cdot \text{Larger} = 3 \cdot \text{Smaller} + 116$

$5(x+2) = 3x + 116$

$5x + 10 = 3x + 116$

$5x - 3x = 116 - 10$

$2x = 106$

$x = 53$

Not even

No such even integers

Oct 31-8:52 AM

Consecutive odd integers

5, 7, 9, 11, ...

23, 25, 27, 29, ...

−17, −15, −13, −11, ...

$x, x+2, x+4, x+6, \ldots$ x must be odd

Oct 31-9:00 AM

Find two consecutive odd integers such that the smaller one is equal to the difference of 170 and 3 times the larger one.

x & $x+2$

Smaller = 170 − 3 · larger

$x = 170 - 3(x+2)$

$x = 170 - 3x - 6$

$x + 3x = 164$

$4x = 164$

$x = 41$

41 & 43

Oct 31-9:02 AM

Find 3 consecutive odd integers such that the sum of the smallest one and 3 times the largest one is equal to the difference of 118 and twice the middle one.

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

Smallest + 3 · Largest = 118 − 2 · middle

$x + 3(x+4) = 118 - 2(x+2)$

$x + 3x + 12 = 118 - 2x - 4$

$4x + 12 = 114 - 2x$

$4x + 2x = 114 - 12$

$6x = 102$

$x = 17$

17, 19, and 21

Oct 31-9:07 AM