

Review: A cashier has \$730 in twenty-dollar bills and five-dollar bills. In all, the cashier has 68 bills. How many twenty-dollar bills does the cashier have?

type of thing	amount of thing (# of bills)	rate/value/ bill value	
\$20	$x$	20	$20x$
\$5	$68-x$	5	$5(68-x)$

$$20x + 5(68-x) = 730$$

$$20x + 340 - 5x = 730$$

$$15x = 730 - 340$$

$$15x = 390$$

$$x = \frac{390}{15} =$$

$$26 \text{ \$20 bills}$$

## 2.5 Inequalities in One Variable

$$10. \quad 5x + 2 \geq 4x - 1$$

$$x \geq -3$$

set-builder:

$$\{x \mid x \geq -3\}$$

interval:

$$[-3, \infty)$$

\* multiplying or dividing by a negative changes the direction of the inequality

$$26. \quad 2 - 5(x + 1) \geq 3(x - 1) - 8$$

$$2 - 5x - 5 \geq 3x - 3 - 8$$

$$-5x - 3 \geq 3x - 11$$

$$-5x - 3x \geq -11 + 3$$

$$-8x \geq -8$$

$$\{x \mid x \leq 1\}$$

$$(-\infty, 1]$$

### Compound Inequalities

and  $\cap$  intersection  $A \cap B$

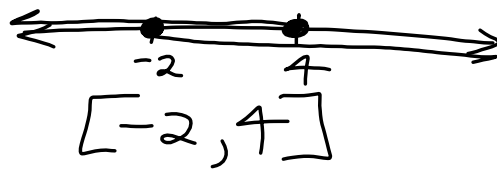
$x$  is in both  $A$  *and*  $B$

or  $\cup$  union  $A \cup B$

$x$  is in either  $A$  *or*  $B$

$$36. x - 3 \leq 1 \text{ and } 2x \geq -4$$

$$x \leq 4 \quad \cap \quad x \geq -2$$



$$\{x \mid -2 \leq x \leq 4\}$$

What if the problem had been...

$$x - 3 \leq 1 \text{ or } 2x \geq -4$$

$$x \leq 4 \quad \cup \quad x \geq -2$$

$$(-\infty, \infty)$$

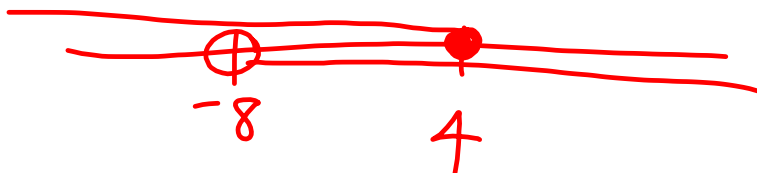
$$\{x \mid x \text{ is a real } \# \}$$

$$\mathbb{R}$$

$$3x - 1 \leq 11 \text{ or } 2x + 5 > -11$$

$$3x \leq 12 \quad \cup \quad 2x > -16$$

$$x \leq 4 \quad \cup \quad x > -8$$



$$(-\infty, \infty)$$

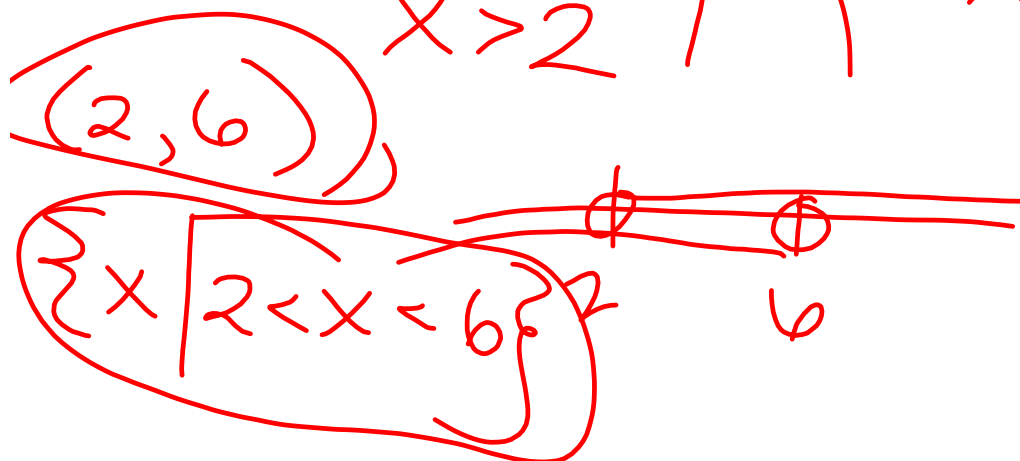
$$\mathbb{R}$$

$$52. \quad 5 < 4x - 3 < 21$$

rewrite as  $5 < 4x - 3$  and  $4x - 3 < 21$

$$-4x < -8 \quad 8 < 4x \quad 4x < 24$$

$$x > 2 \quad 2 < x \quad x < 6$$



$$4 < 3x - 5 \leq 2x - 10$$

$4 < 3x - 5$  and  $3x - 5 \leq 2x - 10$

$$9 < 3x \quad \cap \quad x \leq -5$$

$$3 < x$$



$$3(4x - 2) > -1 \text{ or } 2x + 6 \leq 5 - x$$

$$12x - 6 > -1 \quad 3x \leq -1$$

$$12x > 5 \quad x \leq -\frac{1}{3}$$

$$x > \frac{5}{12} \quad \cup$$



$$(-\infty, -\frac{1}{3}] \cup (\frac{5}{12}, \infty)$$

$$\left\{ x \mid x \leq -\frac{1}{3} \text{ or } x > \frac{5}{12} \right\}$$

d 1. motion formula

a 2. commutativity

h 3. associativity

c 4. additive identity

e 5. multiplicative identity

f 6. additive inverse

i 7. multiplicative inverse

j 8. distributive property

g 9. union

b 10. intersection

a.  $a + b = b + a$

b.  $\cap$  **A**

c. 0

d.  $d = r \cdot t$

e. 1

f.  $-a$

g.  $\cup$  **V**

h.  $a + (b + c) = (a + b) + c$

i.  $1/a$

j.  $a(b + c) = ab + ac$

11.  $A = \{1,5,10,20\}, B = \{5,10,15,20\}$  Find  $A \cap B$ .

$$\{5, 10, 20\}$$

12.  $A = \{1,2,3,4,5\}, B = \{3,4,5\}$  Find  $A \cup B$ .

$$A$$

13. Write in set-builder notation:  $(-\infty, 4]$

$$\{x \mid x \leq 4\}$$

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

14. Write in interval notation:  $\{x \mid -2 \leq x < 6\}$

$$[-2, 6)$$

### Quiz #3 - Tomorrow (Wednesday) - Word problems Test #1 - This Friday! - Chapters 1 & 2

Homework:

- Finish "Old Test #1" on <http://www.asms.net/brewer/>  
we will go over these problems on Wednesday
- Practice all Ch 2 problems on Khan Academy and work toward mastery of Ch 1 problems (and Ch 2)
- Note that 1.1 and 2.3-4 are not sufficiently covered on K.A., so you may want to work some textbook problems for practice prior to the test
- DO NOT WAIT UNTIL THURSDAY NIGHT TO GO TO MATH LAB!
- My office hours this week:
  - > Tuesday 10-10:55 and 1:45-2:40
  - > Wednesday 1:45-2:40 and 3:45-4:40
  - > Thursday morning by appointment only  
(I will be off-campus in the afternoon)