

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?

	#	value	total value
\$5	$68-x$	5	$5(68-x)$
\$20	x	20	$20x$

$$20x + 5(68-x) = 730$$
$$20x + 340 - 5x = 730$$

$$15x = 390$$

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

2.5 Inequalities in One Variable

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

$5x-4x \geq -1-2$

$x \geq -3$

* inequality changes direction if mult/divide by a negative

$\{x \mid x \geq -3\}$ ← set-builder

$[-3, \infty)$ ← interval

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

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

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

$$8 \geq 8x$$

$$\left\{ x \mid \begin{array}{l} 1 \geq x \\ x \leq 1 \end{array} \right\}$$

$$(-\infty, 1]$$

Compound Inequalities

and \cap intersection $A \cap B$
 x is in both A and B

or \cup union $A \cup B$
 x is in A or B

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

$x \leq 4$

$x \geq -2$

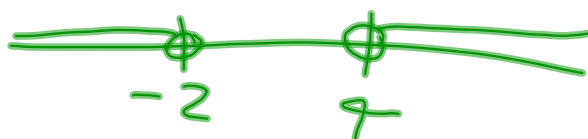


$[-2, 4]$

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

if soln had been

$x < -2$ or $x > 4$



$\{x \mid x < -2 \text{ or } x > 4\}$

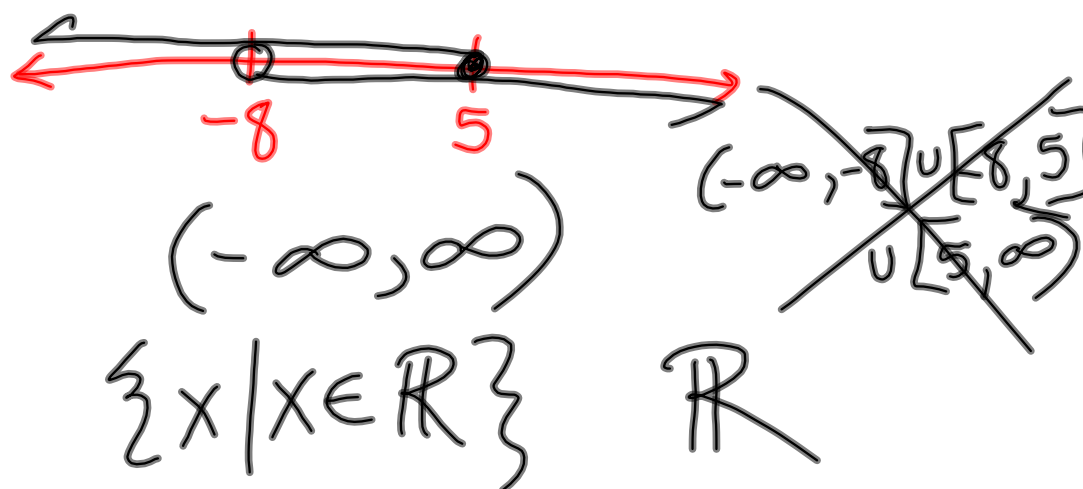
$$3x - 4 \leq 11 \quad \text{or} \quad 2x + 5 > -11$$

$$3x \leq 15$$

$$2x > -16$$

$$x \leq 5 \quad \text{or}$$

$$x > -8$$



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

$$4 < 3x - 5 \quad \text{and} \quad 3x - 5 \leq 2x - 10$$

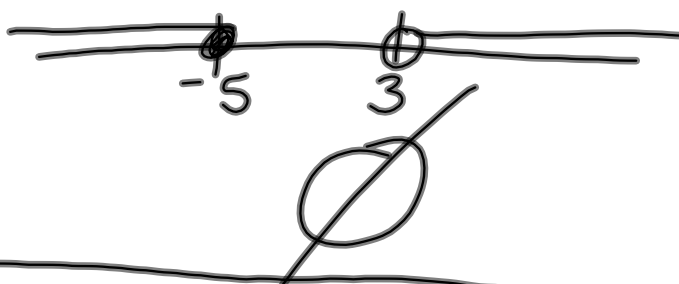
$$9 < 3x$$

$$3 < x$$

$$x > 3$$

$$x \leq -5$$

and



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

$$12x - 6 > -1$$

$$12x > 5$$

$$x > 5/12$$

$$3x \leq -1$$

$$x \leq -1/3$$



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

$$(-\infty, -1/3] \cup (5/12, \infty)$$

use "or"
to combine
conditions

use \cup
to combine
sets

Intermediate Algebra
Brewer

Test #1

Print Name: _____
25 August 2010

Read each problem carefully. You must show all work in order to receive full credit. Circle your final answers for 11-25. Print letter answers NEATLY for 1-10 (if I can't read it, you don't get credit).

Part I (1 point each)

properties

- | | |
|------------------------------------|--------------------------------|
| <u>1</u> . motion formula | a. $a + b = b + a$ |
| <u>2</u> . commutativity | b. \cap |
| <u>3</u> . associativity | c. 0 |
| <u>4</u> . additive identity | d. $d = r \cdot t$ |
| <u>5</u> . multiplicative identity | e. 1 |
| <u>6</u> . additive inverse | f. $-a$ |
| <u>7</u> . multiplicative inverse | g. \cup |
| <u>8</u> . distributive property | h. $a + (b + c) = (a + b) + c$ |
| <u>9</u> . union | i. $1/a$ |
| <u>10</u> . intersection | j. $a(b + c) = ab + ac$ |

Part II (6 points each)

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: $(-\infty, 4]$

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

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

$[-2, 6)$

15. Simplify. $-|-16| - |24|$

$$-16 - 24 = -40$$

16. Simplify. $\frac{2}{3} - \left[\frac{3}{8} + \frac{5}{6} \right] \div \frac{3}{5}$

$$\frac{2}{3} - \left[\frac{3}{8} + \frac{5}{6} \right] \div \frac{3}{5}$$

17. Evaluate the variable expression when $a = 2$, $b = 3$, $c = -1$, and $d = -4$.

$$-3d \div \left| \frac{ab - 4c}{2b + c} \right|$$

18. Translate into a variable expression. Do not simplify.

the difference between the square of a number and the total of twelve and three times the number

19. Solve for x. $5 - 6[2x - 2(x + 3)] = 8 - x$

20. Solve for x . $2[3(x + 4) - 2(x + 1)] = 5x + 3(1 - x)$

21. Find three consecutive even integers such that twice the sum of the first and third integers is twenty more than the second integer.

22. Fifty liters of pure maple syrup that costs \$10 per liter are mixed with imitation maple syrup that costs \$4 per liter. How much imitation maple syrup is needed to make a mixture that costs \$5 per liter?

23. Two airplanes start from the same point and fly in opposite directions. The first plane is flying 50 mph slower than the second plane. In 4 h, the planes are 1800 mi apart. Find the rate of each plane.

24. How many quarts of water must be added to 5 qt of an 80% antifreeze solution to make a 50% antifreeze solution?

25. Solve. Write the solution set in interval notation. $3x + 7 < 10$ or $2x - 1 \geq 5$

2.5

35-72
compound inequalities

& word problems from
old test # 1