

Objectives:

Students will review unit conversions, algebraic expressions, and linear equations.

Algebra Review (1.1 - 1.3)

Unit Conversions

You drive 45 miles per hour. What is your speed in feet per second?

How many feet are in a mile?

5280 feet in one mile

How many seconds are in an hour?

60 seconds in one minute

60 minutes in one hour

3600 seconds in one hour

Algebra Review (1.1 - 1.3)

Unit Conversions

You drive 45 miles per hour. What is your speed in feet per second?

$$\begin{array}{c|c|c}
 \cancel{9} \quad 1 & \cancel{528} \quad 66 & \\
 \hline
 45 \text{ miles} & 5280 \text{ feet} & 1 \text{ hour} \\
 \hline
 1 \text{ hour} & 1 \text{ mile} & 3600 \text{ seconds} \\
 & & \cancel{360} \quad \cancel{72} \quad \cancel{8} \quad 1
 \end{array} =$$

$$\frac{66 \text{ feet}}{1 \text{ second}} \quad \text{or} \quad 66 \text{ feet per second}$$

Real Numbers

What do real numbers consist of?

What are examples of rational numbers, whole numbers, integers, and irrational numbers?

rational numbers: 2, -5, $\frac{2}{3}$, etc.

integers: 2, -2, -3, 0, etc.

whole numbers: 2, 0, 16, etc.

irrational numbers: $\sqrt{2}$, $-\sqrt{14}$, π , etc.

Simplifying expressions

1) Is there a difference between -3^2 and $(-3)^2$?
If no, why not and if yes, what is it?

Yes; $-3^2 = -9$ and $(-3)^2 = 9$

2) Simplify the expression: $1 + 7^2 \cdot (5 - 3)$

$$1 + 7^2 \cdot (2) = 1 + 49 \cdot (2) = 1 + 98 = 99$$

3) What is $4x^2 + (2y)^4$ when $x = -3$ and $y = -2$?

$$4(-3)^2 + (2(-2))^4 = 4(9) + (-4)^4 = 36 + 256 = 292$$

4) What is $2x^2 + (3y)^3$ when $x = 4$ and $y = -3$?

$$2(4)^2 + (3(-3))^3 = 2(16) + (-9)^3 = 32 + -729 = -697$$

Solving Linear Equations

Solve the following expressions:

$$1) \quad 3 = 2p + 5 \qquad p = -1$$

$$2) \quad 7 - 5/3c = 22 \qquad c = -9$$

$$3) \quad 3a + 4 = 2a + 15 \qquad a = 11$$

$$4) \quad 3y + 7 = y - 3 \qquad y = -5$$

****Remember to
turn in your
Syllabus Agreement
Form tomorrow!**

Objective:

Students will review linear equations and solve indicated variables by rewriting formulas and equations.

Solving Linear Equations Cont.

Solve the following expressions:

1) $2(b + 3) = 4b - 2$

$b = 4$

2) $-4(n + 2) = 3(n - 4)$

$n = 4/7$

3) $5(x - 4) = 5x + 12$

no solution

4) $3(x + 5) = 3x + 15$

all real numbers

Solving Linear Equations Cont.

5) You are ordering T-shirts from a catalog. Each T-shirt costs \$15. The cost of shipping is \$6 no matter how many you order. The total cost is \$111. How many T-shirts did you order?

$15t + 6 = 111$ where t is the number of T-shirts 7 T-shirts

6) Your rectangular lawn has an area of 288 square feet. You want to border the lawn with a white picket fence. The lawn is twice as long as it is wide. How much fencing do you need?

$2w(w) = 288$ where w is the width of the lawn 72 feet

$w = 12$; width is 12 feet l (length) $= 2w = 2(12) = 24$ feet

Rewriting Formulas and Equations

Solve the formula for the indicated variable and then use the given information to find the value of the variable.

Distance between opposite vertices of a regular hexagon

1) a) $d = \frac{2a}{\sqrt{3}}$, Solve for a.

$$a = \frac{d\sqrt{3}}{2}$$

b) Find a if $d = 10$ cm.

$$a = 5\sqrt{3}$$

Rewriting Formulas and Equations

Solve the formula for the indicated variable and then use the given information to find the value of the variable.

Formula for converting degrees Celsius to degrees Fahrenheit

2) a) $F = \frac{9}{5}C + 32$, Solve for C.

$$C = \frac{5}{9}(F - 32)$$

b) Find C if F = 50 degrees.

10°C

Rewriting Formulas and Equations

Solve the formula for the indicated variable and then use the given information to find the value of the variable.

Area of a trapezoid

3) a) $A = \frac{1}{2}(b_1 + b_2)h$, Solve for h.

$$h = \frac{2A}{b_1 + b_2}$$

b) Find h if $b_1 = 6$ in., $b_2 = 8$ in., and $A = 70$ in.²


$$h = 10 \text{ in.}$$

Homework

p. 30: 5, 19-20, 25-26

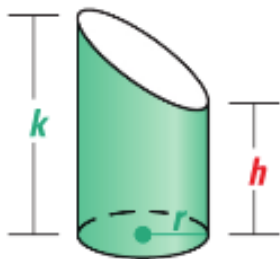
REWRITING FORMULAS Solve the formula for the indicated variable. Then use the given information to find the value of the variable.

5. Solve $A = \frac{1}{2}(b_1 + b_2)h$ for h . Then find the height of a trapezoid with bases of lengths 10 centimeters and 15 centimeters and an area of 75 square centimeters.

 **GEOMETRY** Solve the formula for the variable in red. Then use the given information to find the value of the variable. Round to the nearest tenth.

19. Lateral surface area of a truncated cylinder

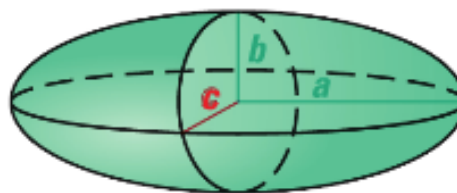
$$S = \pi r(\textcolor{red}{h} + k)$$



Find h if $r = 2$ cm,
 $k = 3$ cm, and $S = 50$ cm².

20. Volume of an ellipsoid

$$V = \frac{4}{3}\pi ab\textcolor{red}{c}$$



Find c if $a = 4$ in.,
 $b = 3$ in., and $V = 60$ in.³

REWRITING EQUATIONS Solve the equation for y . Then find the value of y for the given value of x .

25. $y - 2xy = 15$; $x = -1$

26. $4x + 7y + 5xy = 0$; $x = 1$

Objectives:

Students will be able to graph and solve linear inequalities.

Students will be able to write their answers in interval notation.

Graphing Linear Inequalities

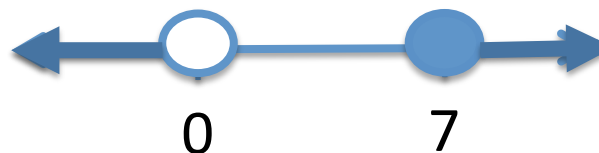
When graphing linear inequalities, how do you know where to shade and when to have an open or closed dot?

****these are graphed on a number line****

1) Graph $-1 \leq x < 3$.



2) Graph $x \geq 7$ or $x < 0$.



What is Interval notation?

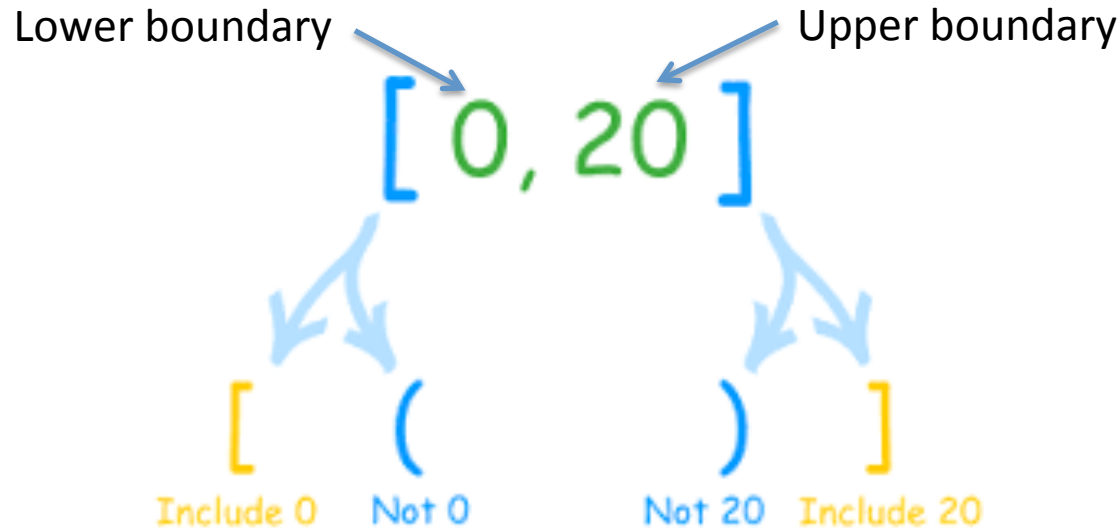
A notation for representing an interval as a pair of numbers where the numbers are the endpoints of that interval. Parentheses and/ or brackets are used to show if the endpoints are included or excluded.

(means “not included” or “open”

[means “included” or “closed”

The word “or” in interval notation is written with the symbol “U”, which means “union”

Examples of Interval Notation



Inequality

$$x > 1$$

$$-3 < x \leq 2$$

$$x \leq -1 \text{ or } x > 4$$

Interval Notation

$$(1, \infty)$$

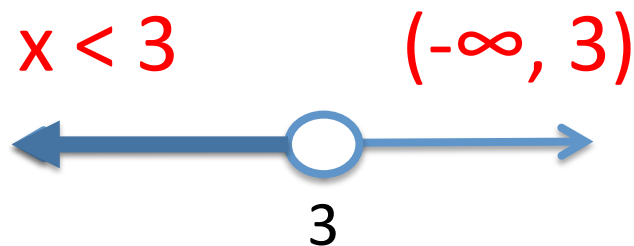
$$(-3, 2]$$

$$(-\infty, -1] \cup (4, \infty)$$

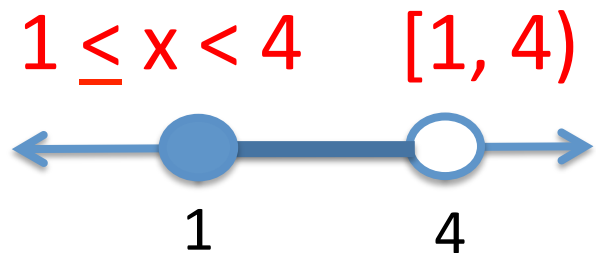
Solving and Graphing Linear Inequalities

Solve the following inequalities. Then graph the solution. Write your solution in interval notation.

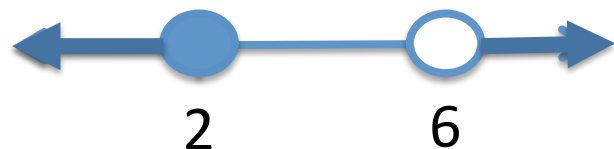
1) $5x + 2 > 7x - 4$



2) $-4 \leq 6x - 10 < 14$



3) $3x + 5 \leq 11$ or $5x - 7 > 23$



$x \leq 2$ or $x > 6$ $(-\infty, 2] \cup (6, \infty)$

Solving Inequalities Cont.

$$4) 2(x - 5) \geq 2x + 3$$

no solution

$$5) 4(x + 2) < 2(2x + 5)$$

all real numbers

****remember if you produce a true statement, then it is all real numbers and when you produce a false statement, then it is no solution**

Homework

p. 45: 32-33, 40-41, 45-46

Chapter 1 Quiz on Tuesday!

For every problem, also write the solution in interval notation!

SOLVING INEQUALITIES Solve the inequality. Then graph the solution.

32. $18 + 2x \leq 9x + 4$

33. $2(x - 4) > 4x + 6$

“AND” COMPOUND INEQUALITIES Solve the inequality. Then graph the solution.

40. $2 < 3x - 1 \leq 6$

41. $-4 \leq 2 + 4x < 0$

“OR” COMPOUND INEQUALITIES Solve the inequality. Then graph the solution.

45. $2x - 3 \leq -4$ or $3x + 1 \geq 4$

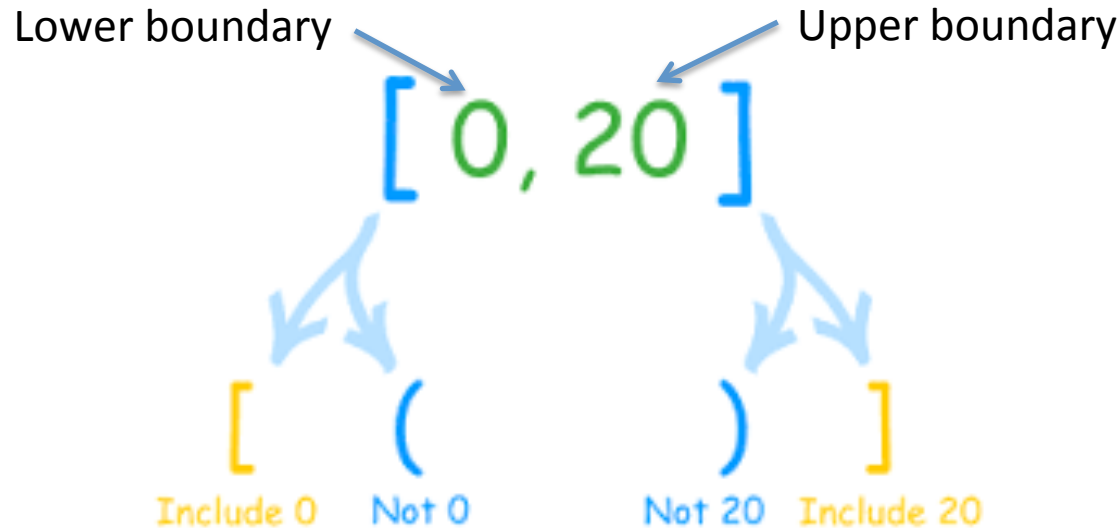
46. $2 + 3x < -13$ or $4 + 2x > 7$

Objectives:

Students will be able to solve absolute value equations and inequalities.

Students will be able to write their answers in interval notation.

Examples of Interval Notation



Inequality

$$x > 1$$

$$-3 < x \leq 2$$

$$x \leq -1 \text{ or } x > 4$$

Interval Notation

$$(1, \infty)$$

$$(-3, 2]$$

$$(-\infty, -1] \cup (4, \infty)$$

Revisiting the Warm Up

Write the solutions to these inequalities in interval notation.

1) $0 \leq \frac{3}{4}x + 3 \leq 4$

$$[-4, 4/3]$$

2) $-x - 4 > 1$ or $2 - 5x \leq -8$

$$(-\infty, -5) \cup [2, \infty)$$

Solving Absolute Value Equations

Solve the following problems. Check for your solutions for any extraneous solutions.

1) $|x - 3| = 5$

$$x = 8 \text{ or } x = -2$$





2) $|5x - 10| = 45$

$$x = 11 \text{ or } x = -7$$

3) $|2x + 12| = 4x$

$$x = 6 \text{ or } \cancel{x = -2}$$

Absolute Value Inequalities

Inequality	Equivalent form	Graph your solution
$ ax + b < c$	$-c < ax + b < c$	
$ ax + b \leq c$	$-c \leq ax + b \leq c$	
$ ax + b > c$	$ax + b < -c$ or $ax + b > c$	
$ ax + b \geq c$	$ax + b \leq -c$ or $ax + b \geq c$	

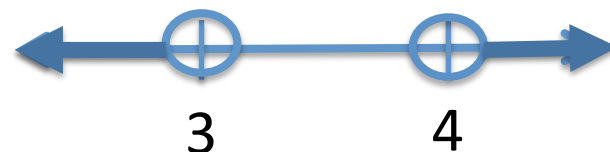
Helpful hint: greatOR than

Solving Absolute Value Inequalities

Solve the following problems. Then graph the solution and write your answer in interval notation.

1) $|2x - 7| > 1$

$$x < 3 \text{ or } x > 4 \quad (-\infty, 3) \cup (4, \infty)$$



2) $\left| \frac{1}{2}x - 10 \right| \leq 4$

$$12 \leq x \leq 28 \quad [12, 28]$$



Homework

p. 55: 34-35, 51-52, 60-61

Chapter 1 Quiz tomorrow!

EXTRANEOUS SOLUTIONS Solve the equation. Check for extraneous solutions.

34. $|3x - 4| = x$

35. $|x + 24| = -7x$

SOLVING INEQUALITIES Solve the inequality. Then graph the solution.

51. $|3w - 15| < 30$

52. $|2x + 6| \geq 10$

60. $\left|\frac{1}{3}m - 15\right| < 6$

61. $\left|\frac{1}{7}y + 2\right| - 5 > 3$