

6.2 SOLVING LINEAR EQUATIONS CONTAINING BRACKETS

Name: _____

Block _____

A) WORKING WITH BRACKETS

We will look at **2 DIFFERENT METHODS** to solve linear equations that contain brackets.
After trying each method it is up to you to decide which you prefer to use.

METHOD ①: THE DISTRIBUTIVE PROPERTY

- ① Expand the brackets *using the distributive property*.
- ② Then solve the equation as before...

Example #1

Solve. $5(x - 3) = 10$

Distributive Property

Let a , b and c be real numbers.

ADDITION:

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

$$\textcircled{3}(x + 5) = 3x + 15$$

$$(b + c)a = ba + ca$$

$$\textcircled{(x + 5)}3 = 3x + 15$$

SUBTRACTION:

$$a(b - c) = ab - ac$$

$$\textcircled{3}(x - 5) = 3x - 15$$

$$(b - c)a = ba - ca$$

$$\textcircled{(x - 5)}3 = 3x - 15$$



91. Solve. $4(m+3)=40$

Expand the left side.

$$4m+12=40$$

Subtract 12 from both sides

$$4m+12-12=40-12$$

$$4m=28$$

Divide both sides by 4.

$$\frac{4m}{4} = \frac{28}{4}$$
$$m=7$$

Check your answer by substituting $m=7$ into the original equation.

$$4(7+3)=40$$

$m=7$ is the solution.

92. $3(m-5)=25$

93. $-5(m-1)=20$

94. $6(m-5)=-6$

95. $-2(m-5)=25$

a) Solve. $2(5x + 7) = 94$

b) Check using substitution.

METHOD ②: DIVIDE FIRST!

① Divide by the _____ in *front of the brackets*.

② Solve the equation like we have in section 6.0 and 6.1.

Example #2

Solve. $5(x - 3) = 10$



a) Solve. $2(7b + 2) = -94$

b) Check using substitution.

c) $5(3 - 2x) = 30$

d) $3(2x - 4) = 8$

e) $22 - 3x = 2(x + 6)$

f) $7x + 2 = 5(x - 2)$

B) WORKING WITH FRACTIONS

We have worked with fractions already in section 6.1. In this section they look a bit different but the same principles apply. We will look at **TWO DIFFERENT METHODS** to work with fractions.

METHOD ①: MULTIPLY BOTH SIDES BY THE DENOMINATOR (OR LCM)

- ① Multiply both sides of the equation by the denominator
- ② Then work with the integers to solve the equation.

Example #1

Solve. $\frac{2x + 1}{3} = 6$



c) Solve. $\frac{10x - 4}{12} = 8$

d) Check using substitution.

METHOD ②: BREAK INTO FRACTIONS

- ① Break the equation into fractions.
- ② Find a common denominator
- ③ Then work with the fractions to solve for the unknown value.

Example #2

Solve. $\frac{2x + 1}{3} = 6$



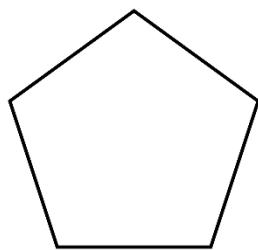
a) Solve. $\frac{3x - 5}{2} = 8$

b) Check using substitution.

C) APPLYING EQUATIONS TO GEOMETRY AND REAL-LIFE ACTIVITIES

Example #1

A regular pentagon has side length of x cm. If each side is 3 cm more than double its original length, the perimeter is 56.2 cm. What is the value of x ?



Example #2

The amount of food energy recommended per day when on an orienteering trip in the mountains can be calculated using the formula $E = \frac{125}{4}(96 - T)$, where E is a measure of the amount of food energy, in Calories, and T is the outside temperature in degrees Celsius. At what outside temperature would the food energy requirement be:

a) 3000 Cal?

b) 4000 Cal?



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Required	Extra Practice	Extension
#1aceg, 2, 3, 4ab, 5, 6, 7abc, 8, q, 10ace, 11, 12, 13, 15, 17, 22a	#1bd fh, 4c, 7d, 10bd, 14, 18, 1q, 22b	20, 21