ALGEBRA UNIT 3: LINEAR EQUATIONS

Multi-Step Equations

Steps

DIFFERENCE BETWEEN EQUATIONS AND INEQUALITIES:

Adding two fractions?

EX. 1

EX. 2

EX. 3

TRANSFORMING FORMULAS

Inverse of
Addition:

Inverse of
Subtraction:

Inverse of
Multiplication:

Inverse of
Division:

To eliminate a
fraction, you can...

WHAT IS THE PURPOSE OF TRANSFORMING?

EXAMPLE 1
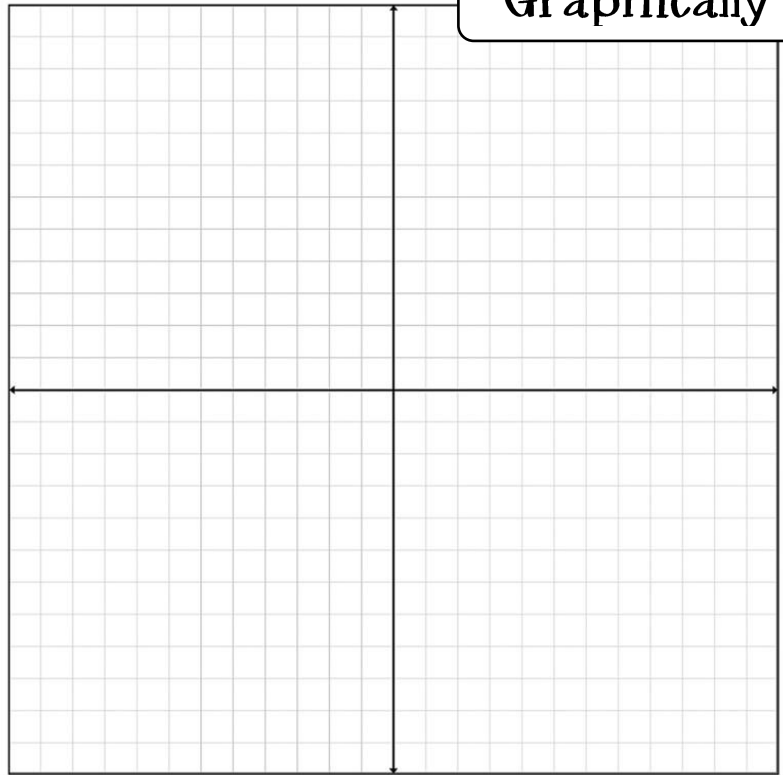
EXAMPLE 2

EXAMPLE 3

Intersection of Graphs Method

$$3x - 2 = x + 1$$

Algebraically

What should happen?

?

Graphically

Using Technology

Multi-Step Equations

Solve the following multi-step equations.

1. $16 = 2(x - 1) - x$

2. $\frac{3}{5}(n - 2) = 36$

3. $2(8 + n) = 22$

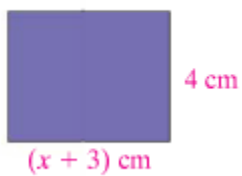4. $-2(a + 3) - a = 0$

5. $2 + a/-4 = \frac{4}{5}$

6. $\frac{2}{3}b + \frac{3}{5}b - 7(b + 3) = 144$

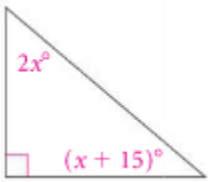For each rectangle, the area is 20 cm². Find the value of x.

7.

4 cm

$(x + 3)$ cm

8.

$(2x - 4)$ cm

10 cm

Find the value of x. (Hint: The sum of the measures of the angles of a triangle is 180°.)

9.

$2x°$

$(x + 15)°$

10.

$(2x + 16)°$

$44°$

$4x°$
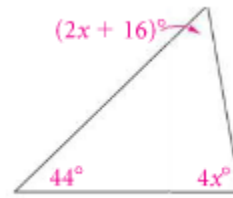
Solve the equations.

11. $11(4 - 6y) + 5(13y + 1) = 9$

12. $2(9n - 1) + 7(n + 6) = -60$

13. $22 - 5(6v - 1) = -63$

14. $18x - (8x - 7) = 67$

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Multi-Step Equations - 2

1.) $\dfrac{x}{2} + \dfrac{3x}{5} = \dfrac{11}{10}$

2.) $\dfrac{1}{2} = \dfrac{x-3}{8}$

3.) $\dfrac{6}{y} = \dfrac{36}{216}$

4.) $\dfrac{x+3}{4} = \dfrac{7}{8}$

5.) $\dfrac{k+5}{10} = \dfrac{k-12}{9}$

6.) $\dfrac{3}{w+6} = \dfrac{5}{w-4}$

6

7.) $\dfrac{m+12}{9m} = \dfrac{5}{9}$

8.) $\dfrac{w^3+7}{w} = \dfrac{9w^2+7}{9}$

9.) $\dfrac{m^2-8}{3m} = \dfrac{4m+1}{12}$

10.) $\dfrac{x}{3} + \dfrac{x-2}{5} = 6$

11.) Bryan and his band want to record and sell CDs. The recording studio charges an initial set-up fee of $300, and each CD will cost $6 to burn. The studio requires bands to make a minimum purchase of $700, which includes the set-up fee and the cost of burning CS. Write and solve an equation to determine the minimum number of CDs the band needs to burn to meet the minimum purchase of $700.

12.) There are 60 students going on a field trip. The students are from three different classes. Mr. Wright's class has 24 students and Mr. Bostic's class has 18 students. How many students are from Mrs. Dickinson's class? Write and solve an equation to determine the number of students.

13.) A large box of 144 chocolates has a width that is three times the height of the box and a length that is twice the width of the boxes. Each chocolate rests in a cube that is 1 in × 1 in × 1 in. Write and solve an equation to calculate the height of the box in inches.

Transforming Formulas

Solve for x.

1) $7x = t$

2) $\dfrac{x-c}{2} = d$

3) $ax - c = b$

4) $fx + 3y = 2z$

5) $e = rx$

6) $2p = kx - q$

Solve for y.

7) $ry + s = tx - m$

8) $x + 3y = 1$

9) $x - 2y = 1$

10) $\dfrac{2}{3}y + k = j$

11) $5(2a + y) = 3b$

12) $\dfrac{2}{3}y + a = a + b$

Rewrite each equation so that y is a function of x.

13.) $2x + y = 5$

14.) $13 = 12x - 2y$

15.) $9 - y = 1.5x$

16.) $\frac{y}{5} - 7 = -2x$

17.) $-3x + 4y - 5 = -14$

18.) $\frac{1}{5}(25 - 5y) = 4x - 9y + 13$

Justification of Steps in Multi-step Equations

Solve each equation and justify each step using the properties above.

1. $2(4x - 3) - 8 = 4 + 2x$

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2. $24a - 22 = -4(1 - 6a)$

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3. $5n + 34 = -2(1 - 7n)$

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4. $3n - 5 = -8(6 + 5n)$

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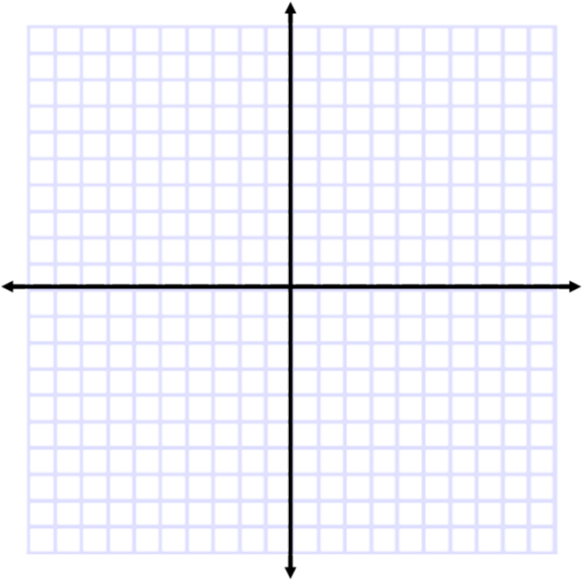
5. $-3(4x + 3) + 4(6x + 1) = 43$

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6. $-5(1 - 5x) + 5(-8x - 2) = -4x - 8x$

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7. $24a - 22 = -4(1 + 6a)$

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8. $-(7 - 12x) = 9 - 8x$

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Intersection of Graphs Method

Use each equation and solve it in 3 manners, algebraically, graphing, and using technology.

$$x + 3 = x + 1$$

Solve algebraically	Solve by graphing	Solve by using technology
Intersection/Solution: _____	Intersection/Solution: _____	Intersection/Solution: _____

$$x - 2 = 5$$

Solve algebraically	Solve by graphing	Solve by using technology
Intersection/Solution: _____	Intersection/Solution: _____	Intersection/Solution: _____

$$2x + 7 - 3 = 5x - 3x + 4$$

Solve algebraically	Solve by graphing	Solve by using technology
Intersection/Solution: _____	Intersection/Solution: _____	Intersection/Solution: _____

$$f(x) = 2x - 4 \quad and \quad g(x) = -\frac{1}{2}x + 1$$

Solve algebraically	Solve by graphing	Solve by using technology
Intersection/Solution: _____	Intersection/Solution: _____	Intersection/Solution: _____

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