Algebra Properties of Equality for Real Numbers

1. Complete the proof
   Given: $45 + 2(x - 10) = 85$
   Prove: $x = 30$

5|5

Statement	Reason
1. $45 + 2(x - 10) = 85$	1. Given
2. $2(x - 10) = 40$	2. Subtraction PoE for ℝ
3. $2x - 20 = 40$	3. Distributive PoE for ℝ
4. $2x = 60$	4. Add'n PoE for ℝ
5. $x = 30$	5. Division PoE for ℝ

+1 +1 +1 +1 +1

2. Complete the proof
   Given: $5x + 34 = -2(1 - 7x)$
   Prove: $x = 4$

12|12

Statement	Reason
1. $5x + 34 = -2(1 - 7x)$	1. Given
2. $5x + 34 = -2 + 14x$	2. Distributive PoE for ℝ
3. $5x + 36 = 14x$	3. Add'n PoE for ℝ
4. $36 = 9x$	4. Subtraction PoE for ℝ
5. $4 = x$	5. Div'n PoE for ℝ
6. $x = 4$	6. Symmetric PoE for ℝ

+1 +1 +1 +1 +1 +1 +1 +1 +1 +1 +1 +1

Solving Linear Equations & Evaluating Expressions

3. $DO = 5x + 3$
   $OG = 7x - 9$

2/2 a. If $DO = OG$, find the value of x.

$5x + 3 = 7x - 9$ +1
$3 = 2x - 9$
$12 = 2x$
$6 = x$ +1

3/3 b. Find DO.

$DO = 5x + 3$ +1
$= 5(6) + 3$ +1
$= 30 + 3$
$DO = 33$ +1

4. $DO = 6x$
   $OG = 5x + 18$
   $DG = 15x - 2$

2/2 c. If $DO + OG = DG$, find the value of x.

$(6x) + (5x + 18) = 15x - 2$ +1
$11x + 18 = 15x - 2$
$18 = 4x - 2$
$20 = 4x$
$5 = x$ +1

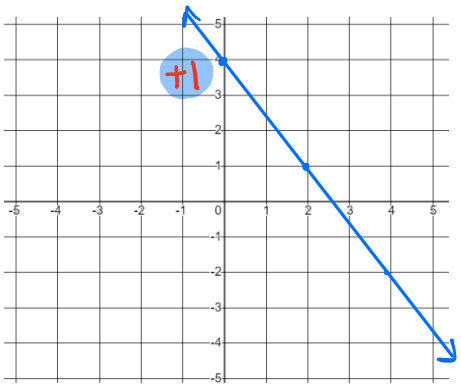
3/3 d. Find DG

$DG = 15x - 2$ +1
$= 15(5) - 2$ +1
$= 75 - 2$
$DG = 73$ +1

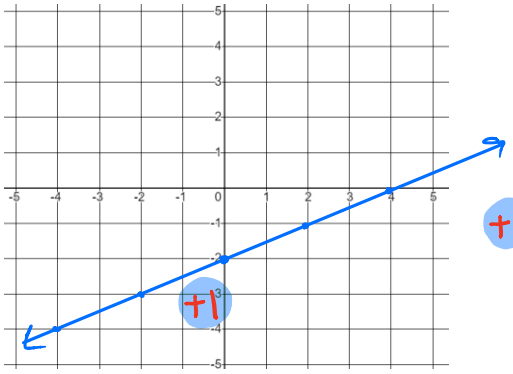
Graphing Lines

Graph each line.

5. $y = -\frac{3}{2}x + 4$

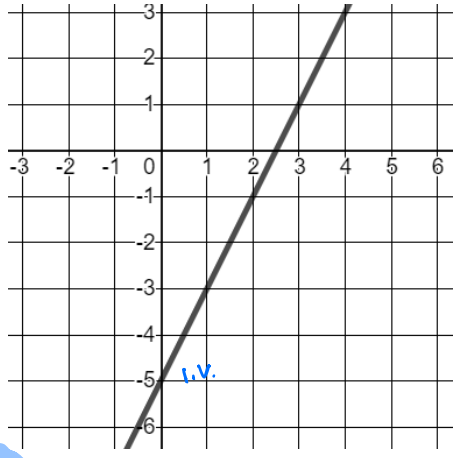


6. $y = \frac{1}{2}x - 2$

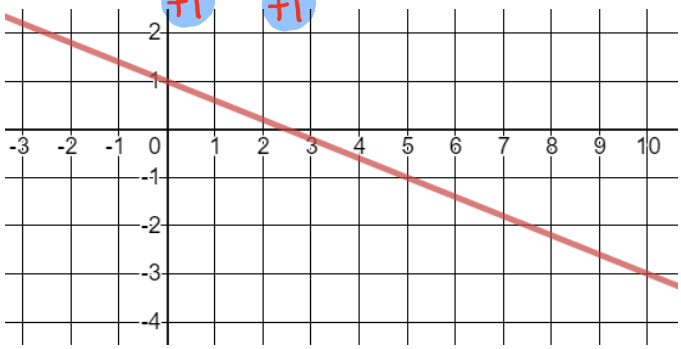


Given the graph, write the equation.

7. y = 2x - 5



8. $y = -\frac{2}{5}x + 1$



9. George has 2 dust bunnies to sell and 10 kitten mittens to sell. He needs to sell these items to purchase a $10 iPhone 1.

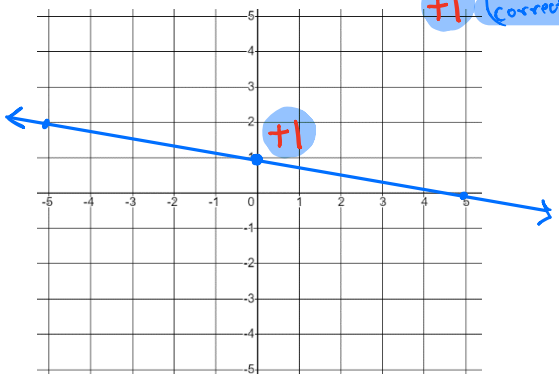
a. Write an equation, with x = price per dust bunny and y = price per mitten, that George could use represent all the prices he charges per item to make enough money to buy a ~~cat hat~~. iPhone

$2x + 10y = 10$

$10y = -2x + 10$

$y = -\frac{1}{5}x + 1$

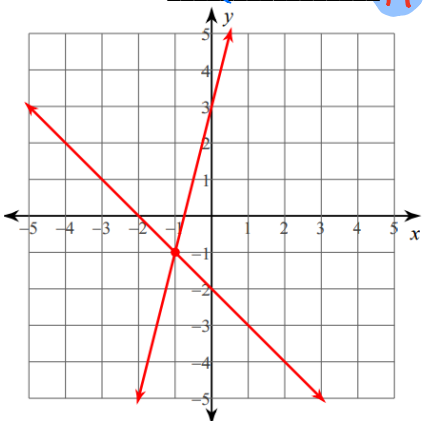
b. Graph the equation you made in *part a*



Systems of Equations

1/1 Find the solution to the system of equations graphed.

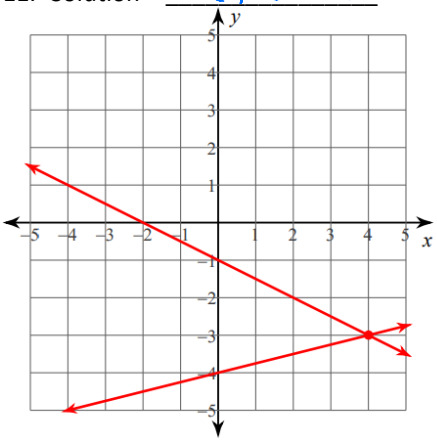
10. Solution = (−1, −1) +1



$y = 4x + 3$
$y = -x - 2$

1/1

11. Solution = (4, −3) +1



$y = -\frac{1}{2}x - 1$
$y = \frac{1}{4}x - 4$

3/3 Solve each system of equations.

12. Solution = (4, 3) +1 +1

$2x - 3y = -1$
$y = x - 1$

② $y = x - 1$
$y = (4) - 1$
$y = 3$

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

3/3

13. Solution = (7, −1) +1 +1

$-4x + 2y = -30$
$4x + 8y = 20$

① $10y = -10$ +1
$y = -1$

② $4x + 8y = 20$
$4x + 8(-1) = 20$ +1
$4x - 8 = 20$
$4x = 28$
$x = 7$

Loaves & Malk

14. While watching Rocky IV, George pounded some loaves of meat and guzzled glasses of malk. Let x represent the number of loaves George ate and y represent the number of glasses of malk he drank. The sum of the loaves and glasses is 12. The difference of the number of loaves and number of glasses is 4.

1/1 a. Make a system of equations to represent this situation.

Part a.

① $x + y = 12$ +1
$x - y = 4$

② $2x = 16$ +1

$x = 8$

③ $(8) + y = 12$ +1
$y = 4$

4/4 b. Find the value of the two numbers.

+1 George ate 8 loaves and drank 4 glasses. +1

-1 point if you do not use Sentence

Factoring

4/4 Factor each expression.

15. $x^2 - 11x + 24$ $= (x-8)(x-3)$ +1

2/2 16. $8x^2 - 32$ $= 8(x^2-4)$ +1

$= 8(x-2)(x+2)$ +1

2/2 17. $2x^2 + 14x + 20$ $= 2(x^2+7x+10)$ +1

$= 2(x+5)(x+2)$ +1

4/4 Solve each equation by factoring.

18. $x^2 + 8x = -15$

$x^2+8x+15=0$ +1

$(x+5)(x+3)=0$ +1

$x+5=0$ $x=-5$ | $x+3=0$ $x=-3$ +1 +1

4/4 19. $-4x^2 - 8x - 3 = -3 - 5x^2$

$x^2-8x=0$ +1

$x(x-8)=0$ +1

$x=0$ | $x-8=0$ $x=8$ +1 +1

8/8 20. Standing on top of a 12-story building in downtown Gilmore, Super George sees a dog-kicking villain. Fulfilling his duty, Super George takes flight. The height in feet of Super George's body is modeled by the equation $H(t) = -t^2 + 5t + 120$, where t stands for the number of seconds after Super George takes flight.

a. At what time(s) is Super George 36 feet high?

$36 = -t^2+5t+120$ +1

$t^2-5t-84=0$ +1

$(t+7)(t-12)=0$ +1

+1 $t+7=0$ $t=-7$ +1 Doesn't make sense

$t-12=0$ $t=12$ +1 +1

+1 At 12 seconds, George is 36 feet high.

-1 point if you do not use Sentence