Bellwork

Solve.

1. $7x^2 - 20x - 3 = 0$

$1\cdot7$ $1\cdot3$

$(7x+1)(x-3)=0$

$x=-1/7 \quad x=3$

2. $3x^2 + 5x - 12 = 0$

$1\cdot3$ $1\cdot12$ $2\cdot6$ $3\cdot4$

$(3x-4)(x+3)=0$

$x=\frac{4}{3} \quad x=-3$

3. $12x^2 - 28x - 24 = 0$

$1\cdot3$ $1\cdot6$ $2\cdot3$

$4(3x^2-7x-6)=0$

$4(3x+2)(x-3)=0$

$x=-2/3 \quad x=3$

4. $-16n^2 + 12n = 0$

$-4n(4n-3)=0$

$-4n=0 \quad 4n-3=0$

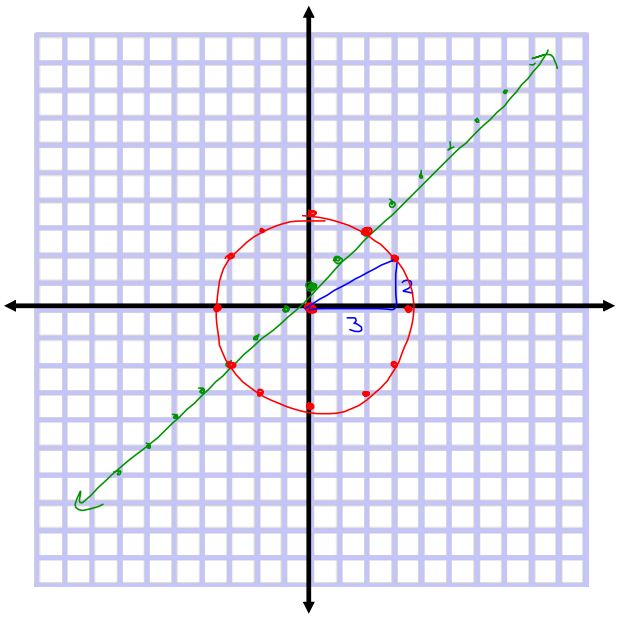
$n=0 \quad n=3/4$

5. $8x^2 + 38x - 10 = 0$

$2(4x^2+19x-5)=0$

$2(4x-1)(x+5)=0$

$x=1/4 \quad x=-5$



$(2,3)$

$(-3,-2)$

8) $x^2+y^2=13$

$r=\sqrt{13}\approx 3.6$

$y=x+1$

$4+9=13$

2 3

Solving Systems Algebraically

By Substitution

1. $y = 2x + 2$
   $3y - 4x = 6$

(0, 2)

$3(2x+2) - 4x = 6$

$6x + 6 - 4x = 6$

$2x + 6 = 6$
$\quad -6 \quad -6$

$\frac{2x}{2} = \frac{0}{2}$

$x = 0$

Your turn:)

2. $-7x + y = -5$ $\quad +7x \quad +7x$
   $3x + 8y = 19$

$y = 7x - 5$

(1, 2)

$3x + 8(7x - 5) = 19$

$3x + 56x - 40 = 19$

$59x - 40 = 19$

$59x = 59$

$x = 1$

Solving Systems using Elimination....

(my favorite...if there is such a thing as a favorite way to solve a math problem.)

Combine the two equations to **ELIMINATE** a variable!

$5x + 4(5) = 55$
$5x = 35$
$x = 7$

$$5x + 4y = 55$$
$$-5x + 3y = -20$$

$7y = 35$
$y = 5$ $(7, 5)$

$3(8) + 4y = 28$
$4y = 4$
$y = 1$

$$3x + 4y = 28$$
$$2(3x - 2y) = (22)2$$

$6x - 4y = 44$

$9x = 72$
$x = 8$

$(8, 1)$

Solve by using elimination.

3. $$-4x + 4y = -12$$
$$-2(-x + 2y) = (-14)(-2)$$

$2x - 4y = 28$

$-2x = 16$
$x = -8$

$-4(-8) + 4(y) = -12$
$32 + 4y = -12$
$-32 \quad -32$

$4y = -44$
$y = -11$

$(-8, -11)$

Pull

4. **Solve by eliminating the x.**

$6x - 5(-1) = 17$

$6x + 5 = 17$

$6x = 12$

$x = 2$

$2(6x - 5y) = (17)2$

$-3(4x + 2y) = (6)-3$

$12x - 10y = 34$

$-12x - 6y = -18$

$-16y = 16$

$y = -1$

$(2, -1)$

Solve by eliminating the y.

$6x - 5y = 17$

$4x + 2y = 6$

$(2, -1)$

How do you solve a system algebraically that is not 2 lines?

5. $x^2 + y^2 = 100$

$y - x = 2$ $\quad y = x + 2$

$x^2 + (x+2)^2 = 100$

$(x+2)(x+2)$

$x^2 + x^2 + 2x + 2x + 4 = 100$

$2x^2 + 4x - 96 = 0$

$2(x^2 + 2x - 48) = 0$

$2(x+8)(x-6) = 0$

$x = -8$ or $x = 6$

$(-8, -6)$

$(6, 8)$

6. $y = x^2 - 9x - 18$

$-1(y) = (x + 3)-1$

$5+\sqrt{46}$

$-y = -x - 3$

$0 = x^2 - 10x - 21$

$x = \frac{10 \pm \sqrt{100 - 4(1)(-21)}}{2(1)} = \frac{10 \pm \sqrt{184}}{2}$ 4.46

$\frac{10 \pm 2\sqrt{46}}{2} = 5 \pm \sqrt{46}$

11.8 14.8

$(5+\sqrt{46}, 8+\sqrt{46})$

$(5-\sqrt{46}, 8-\sqrt{46})$

7. $x^2 - 2y = 8$

$-x^2 + -y^2 = -16$

$-y^2 - 2y = -8$

$y^2 + 2y - 8 = 0$

$(y+4)(y-2) = 0$

$y = -4 \quad y = 2$

$x^2 - 2(-4) = 8$

$x^2 + 8 = 8$

$-8 \quad -8$

$x^2 = 0$

$x = \pm\sqrt{0}$

$x = 0$

$(0, -4)$

$x^2 - 2(2) = 8$

-4

$x^2 = 12$

$x = \pm\sqrt{12}$

$x = \pm 2\sqrt{3}$

$(2\sqrt{3}, 2)$

$(-2\sqrt{3}, 2)$