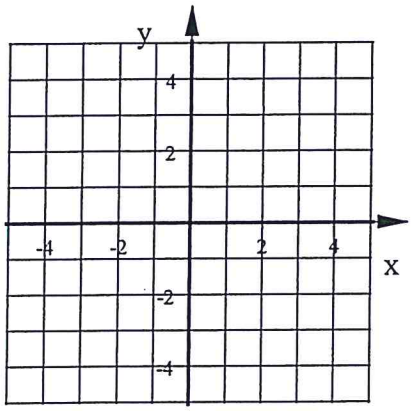
Algebra 1 Bellwork Friday, June 5, 2015

1. Graph this system of inequalities. Shade the solution region a different color.

$y \leq -\frac{1}{3}x$ $\quad\quad$ $9x - 18y \leq 36$



2. You use your boat on a nearby river to make two trips. You travel downstream 13.5 miles in 1.8 hours. You turn around and travel upstream 7.26 miles in 2.2 hours. Write and solve a system of equations to find the speed of the boat and the speed of the current in the river.

Boat speed =

Current speed =

Simplify each. Give answers so that NO exponents are zero or negative. Give fractional answers in reduced form (NO DECIMALS)

3. $\left(\frac{k^{-5}n^{12}}{2k^3n^6}\right)^{-3} =$

4. $(4m^{-5}n^7p^8)^{-2}(2m^4n^{-8}p^5)^3$

5. The deer population in a rural area has been decreasing 3.06% each year. In 2011 the deer population was estimated to be 8,400.

a) Find the deer population in 2018.

b) Find the deer population in 2005.

Factor each completely.

6. $18Q^2 + 30Q$

7. $24x^2 + 10x - 4$

8. $150m^3 - 294m$

Solve each quadratic equation. Round to the nearest tenth when needed.

9. $5x^2 + 13 = 43$

10. $x^2 - 10x = 24$

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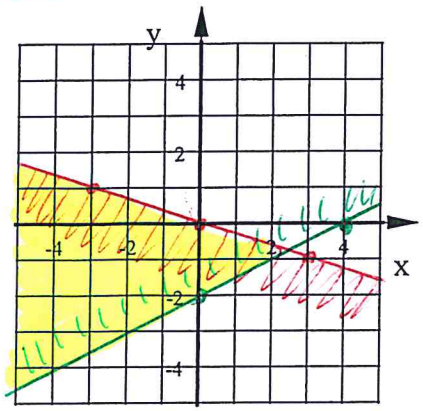
ANSWERS

1. Graph this system of inequalities. Shade the solution region a different color.

$y \le -\frac{1}{3}x$ $\quad 9x - 18y \le 36$

x-int 4 y-int −2 TEST (0,0) $0 - 0 \le 36$ ✓



2. You use your boat on a nearby river to make two trips. You travel downstream 13.5 miles in 1.8 hours. You turn around and travel upstream 7.26 miles in 2.2 hours. Write and solve a system of equations to find the speed of the boat and the speed of the current in the river.

B Boat speed = 5.4 mph

C Current speed = 2.1 mph

Downstream $13.5 = (B+C)1.8$ → $7.5 = B+C$

upstream $7.26 = (B-C)2.2$ → $+\ 3.3 = B-C$

$10.8 = 2B$ $\quad B = 5$

$7.5 = B+C$

$7.5 = 5.4 + C$ $\quad C = 2.1$

Simplify each. Give answers so that NO exponents are zero or negative. Give fractional answers in reduced form (NO DECIMALS)

3. $\left(\frac{k^{-5}n^{12}}{2k^3n^6}\right)^{-3} = \left(\frac{n^6}{2k^8}\right)^{-3} = \left(\frac{2k^8}{n^6}\right)^3 = \frac{8k^{24}}{n^{18}}$

4. $(4m^{-5}n^7p^8)^{-2}(2m^4n^{-8}p^5)^3$

$= (4^{-2}m^{10}n^{-14}p^{-16})(2^3m^{12}n^{-24}p^{15})$

$= 4^{-2} \cdot 2^3 m^{22} n^{-38} p^{-1} = \frac{8m^{22}}{16n^{38}p} = \frac{m^{22}}{2n^{38}p}$

5. The deer population in a rural area has been decreasing 3.06% each year. In 2011 the deer population was estimated to be 8,400.

a) Find the deer population in 2018.

$100 - 3.06 = 96.94\%$

$b = .9694$

$y = 8400(.9694)^7 = 6758$

b) Find the deer population in 2005.

$y = 8400(.9694)^{-6} = 10{,}122$

$y = 8400(.9694)^x$

Factor each completely.

6. $18Q^2 + 30Q$

$6Q(3Q+5)$

7. $24x^2 + 10x - 4$

$2(12x^2 + 5x - 2)$

-24, 8, -3, 5

	3x	+2
4x	$12x^2$	+8x
−1	−3x	−2

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

8. $150m^3 - 294m$

$= 6m(25m^2 - 49)$

$= 6m(5m \pm 7)$

Solve each quadratic equation. Round to the nearest tenth when needed.

9. $5x^2 + 13 = 43$ use SQ ROOTS

$-13 \quad -13$

$\frac{5x^2}{5} = \frac{30}{5}$

$x^2 = 6$

$x = \pm\sqrt{6}$

$x = \pm 2.4$

10. $x^2 - 10x = 24$ TRY FACTORING

$x^2 - 10x - 24 = 0$

$(x-12)(x+2) = 0$

$x = -2, 12$

-24, -12, 2, -10