

Key

Name: _____
 Test #4a - Math 11a
 Fall 2008

90

In: answers. You may use your calculator. All work must be shown in the manner shown in class in order to receive full credit. An answer only does not guarantee full credit, and more than likely will not receive full credit. Box your final answer and when more room is needed please direct me to the work. Good luck!

1. Simplify the following:

a) $(-2x^3y^2)(-7x^2y^4)$
 $+14x^5y^6$

b) $\frac{-36x^5y^4}{-6x^3y^7}$
 $\frac{+6x^2}{y^3}$

c) $\frac{c^{-7}d^{-1}}{f^{-6}}$
 $+\frac{f^6}{c^7d}$

d) $3x^0 - 7y^0$
 $3 - 7 = -4$
 $-4x^0y^0$ is -4

e) $\left(\frac{-5a^3b^4c^0}{3a^2b^6c^5}\right)^{-4}$
 $+\frac{81b^8c^{20}}{625a^4} = \left(\frac{-5a}{3b^2c^5}\right)^{-4} = \left(\frac{3b^2c^5}{-5a}\right)^4$

2. Expand completely. Simplify

a) $(x+3)(x-5)$
 $x^2 - 2x - 15$

b) $(2x+5)(5x-3)$
 $10x^2 + 19x - 15$

d) $(2x+1)(2x-1)$
 $4x^2 - 1$

e) $(x+2)(x^2-2x+4)$
 $x+2$
 $2x^2 - 4x + 8$
 $x^3 - 2x^2 + 4x$
 $x^3 - 2x^2 + 4x + 8$

e) $(2x-3)^2$
 $4x^2 - 12x + 9$

3. Divide the following. Show all work. Remember they aren't the same.

a) $\frac{3x^3y^2 - 4x^2y^2 + 9}{4xy^2}$
 $\frac{3x^2}{4} - x + \frac{9}{4xy^2}$

b) $(4x^2 - 3x + 2) \div (x - 2)$
 $4x + 5 + \frac{12}{x-2}$
 $x-2 \overline{) 4x^2 - 3x + 2}$
 $-4x^2 + 8x$
 $5x + 2$
 $-5x + 10$
 12

+49

4. Add or subtract. Simplify completely.
 a) $(2x^3 - 7x^2 + 3x - 9) + (3 + 3x^2 - 7x^3 - x)$

$-5x^3 - 4x^2 + 2x - 6$

b) $(3x - 4x^2 + 9) - (7x - 9x^3 - 8x^2 + 16)$

$9x^3 + 8x^2 - 7x - 16$
 $-4x^2 + 3x + 9$
 $9x^3 + 4x^2 - 4x - 7$

5. Write the following in standard form.

a) 2.5×10^5 . Move Right 5 places not 15 zeros. Positive
 $250,000$

b) 3.2×10^{-3}
 0.0032

c) 12.9×10^{-5}
 0.000129

6. Change the following to correct scientific notation.

a) $209,000,000$. Correct $1 \leq x < 10$
 2.09×10^8 correct for positive

b) 0.00000027
 2.7×10^{-7}

7. Multiply/divide using only scientific notation. You **MUST** show your work using exponent rules or I will only give you partial credit. Make sure your answer is in correct scientific notation.

a) $(2.5 \times 10^5)(2.5 \times 10^3)^5$
 6.25×10^8 work is 1/2 pt.

b) $\frac{1.08 \times 10^{3-7}}{1.2 \times 10^7}$
 0.9×10^{-4}
 $9 \times 10^{-1} \times 10^{-4} = 9 \times 10^{-5}$

8. For all the problems show setup, and a system of equations in 2 variables that can be used to solve it but solve only 1 problem.

a) A lab has a 20% acid solution and a 50% acid solution. How many liters of each are required to obtain 600 liters of a 30% acid solution?

	V	%	Pure Acid
Weak	$x \frac{1}{2}$	20%	$0.2x \frac{1}{2}$
Strong	$y \frac{1}{2}$	50%	$0.5y \frac{1}{2}$
mix	600L	30%	$(0.3 \times 600) = 180$

$0.2x + 0.5y = 180$
 $x + y = 600$

$2x + 5y = 1800$
 $-2x - 2y = -1200$
 $3y = 600$
 $y = 200$

200L of 50%
 400L of 20%

John travels down the river to Lovelyville in 5 hr. and his return trip takes 6 hr. If the distance to Lovelyville is 90 miles what is his boat's rate of speed and what is the current's rate of speed?

	D	R	T
Down	90	$x+y$	5hr.
Up	90	$x-y$	6hr.

$x = \text{rate of boat}$
 $y = \text{current speed}$
 $5(x+y) = 90$
 $6(x-y) = 90$

$5(x+y) = 90$
 $6(x-y) = 90$
 $30x + 30y = 540$
 $30x - 30y = 450$
 $60y = 990$
 $y = 16 \frac{3}{2}$

$1 \frac{1}{2} \text{ mph}$
 $16 \frac{1}{2} \text{ mph}$

$5(\frac{33}{2}) + 5y = 90$
 $\frac{165}{2} + 5y = 90$
 $5y = 15$
 $y = 3$

c) $\frac{+4}{+4}$

Julie invested \$24,000 in two funds. The first, a bond, paid 5% simple annual interest and the 2nd, a money market, paid 3% simple annual interest. She earned a total of \$1120 in interest in one year. How much did she invest at each rate?

	P	R	T	I
Bond	x	5%	1	$0.05x$
MM	y	3%	1	$0.03y$
	\$24,000			\$1120

$$\begin{aligned} x + y &= 24000 \\ 0.05x + 0.03y &= 1120 \end{aligned}$$

$$\begin{aligned} -3x - 3y &= -72000 \\ 5x + 3y &= 112000 \\ \hline 2x &= 40,000 \\ x &= 20,000 \end{aligned}$$

9. You may use the method of your choice to solve the following system.

$$\begin{aligned} -2(2x + 9y) &= -3 \\ 18y &= -4x - 3 \end{aligned}$$

$$\begin{aligned} -4x - 18y &= 6 \\ 4x + 18y &= -3 \\ \hline 0 &= 3 \end{aligned}$$

Solving +1

\emptyset +1

10. Factor each of the following completely.

a) $12x^4 + 48x^3y^2 - 24x^2y + 60x$

$$12x(x^3 + 4x^2y^2 - 2xy + 5)$$

b) $\frac{+4}{+4}$

$8x^2y - 12xy + 2x - 3$

$$\begin{aligned} &= 4x(2xy - 3) + 1(2x - 3) \\ &= (4xy + 1)(2x - 3) \end{aligned}$$

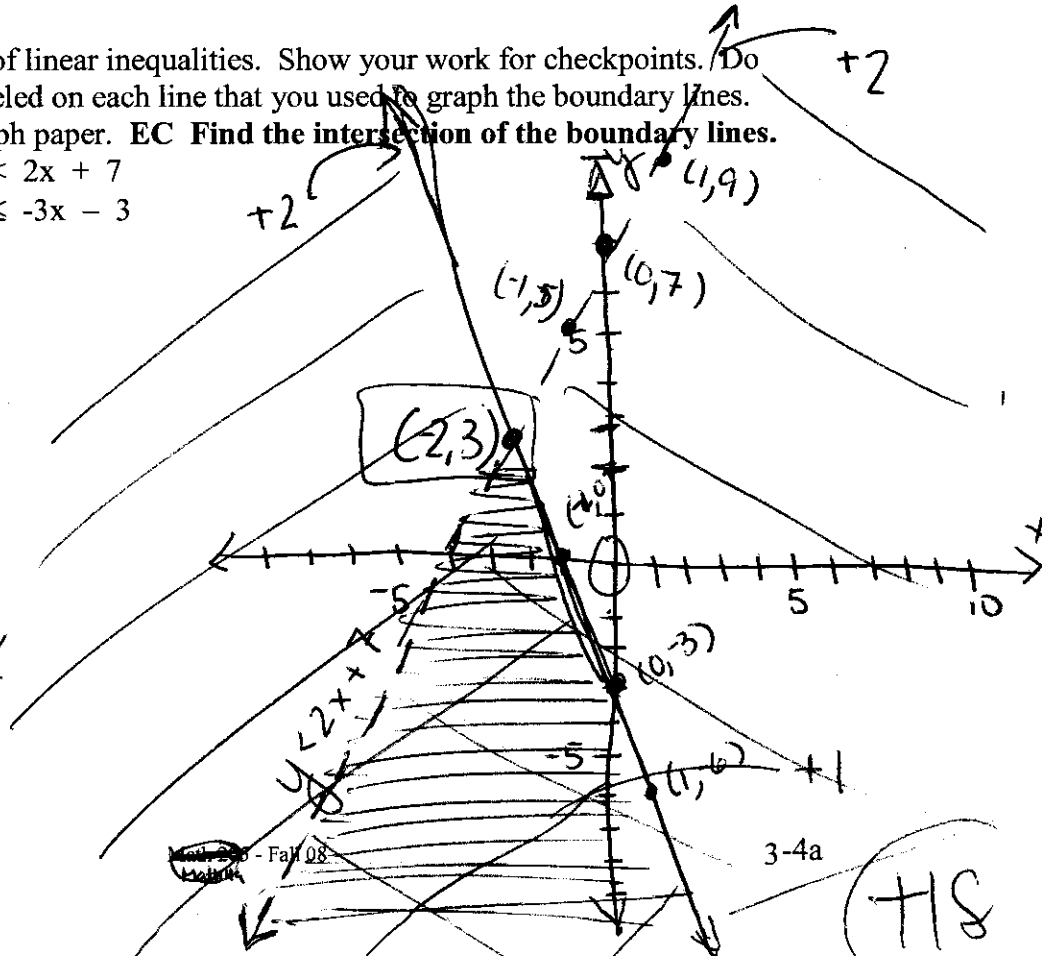
11. Solve the system of linear inequalities. Show your work for checkpoints. Do show 2 points labeled on each line that you used to graph the boundary lines. Use your own graph paper. EC Find the intersection of the boundary lines.

$$\begin{aligned} y &< 2x + 7 \\ y &\leq -3x - 3 \end{aligned}$$

EC + $\frac{2}{2}$

$$\begin{aligned} y &= 2x + 7 \\ -y &= 3x + 3 \\ \hline 0 &= 5x + 10 \\ -10 &= 5x \\ -2 &= x \\ y &= 2(-2) + 7 \\ &= 3 \end{aligned}$$

Ordered Pair $\frac{+1}{2}$



+18

12. Simplify the following: $\frac{x^2 - 2x - 15}{x^3 - 7x^2 + 10x} = \frac{(x-5)(x+3)}{x(x^2-7x+10)} = \frac{\cancel{(x-5)}(x+3)}{x\cancel{(x-5)}(x-2)}$

$$= \boxed{\frac{x+3}{x(x-2)}}$$

13. Divide. Don't forget to simplify. $\frac{2(x^2-4)}{x^2-4x+4} \div \frac{2x^2-8}{x^2+5x+4} = \frac{(x-2)^2}{\cancel{(x+4)}(x+1)} \cdot \frac{\cancel{(x+4)}(x-1)}{2(x+2)\cancel{(x-2)}} = \boxed{\frac{(x-2)(x-1)}{2(x+1)(x+2)}}$

14. Add or Subtract. Don't forget to simplify.

a) $\frac{1(x+1)}{2x+2(x+1)} - \frac{x-1}{x^2-1} = \frac{x-1-2x}{LCD} = \frac{-x-1}{LCD} = \frac{-(x+1)}{2(x+1)(x-1)} = \boxed{\frac{-1}{2(x-1)}}$

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

b) $\frac{x^2-4x-5}{x^2-3x+2} + \frac{x^2+4x-3}{x^2-3x+2} = \frac{2x^2-8}{(x-2)(x-1)} = \frac{2(x^2-4)}{(x-2)(x-1)}$

$$= \frac{2\cancel{(x-2)}(x+2)}{\cancel{(x-2)}(x-1)} = \boxed{\frac{2(x+2)}{x-1}}$$