

**Instructions:** Please show all pertinent work for each problem and ~~show~~  
 Remember that a correct answer does not assure full credit; credit will be assigned for correct work as well as for the correct answer, with emphasis on work. You may not use a calculator for this exam. Please attach your note card to the back of the test. Good luck!!

1. Use exponent rules to simplify the following. Write your answer without negative exponents. Show all work!

a)  $(-5x^6)(7x^3)$   
 $\frac{-5x^6 \cdot 7x^3}{+1 \cdot \frac{1}{2}}$   
 $\boxed{-35x^9}$

b)  $\frac{63xy^3}{9x^5y}$  No neg.  $\frac{1}{2}$   
 $\frac{7y^2}{x^4}$

c)  $(3x^6y)^3$   
 $\frac{27x^{18}y^3}{+1 \cdot \frac{1}{2}}$

+13 1/2

d)  $(5x^5y^{-6})^{-2}$   
 $\left(\frac{1}{5x^5y^{-6}}\right)^2$   
 $\frac{y^{12}}{25x^{10}}$   
 Neg  $\frac{1}{2}$   
 Neg  $\frac{1}{2}$

e)  $\left[\frac{3x^{-5}y^3z}{10x^2yz^{-5}}\right]^3$   
 $\left(\frac{3x^{-5}y^3z}{2x^2yz^{-5}}\right)^3 = \frac{27y^6z^{18}}{8x^{21}}$   
 No neg.  $\frac{1}{2}$

2. Evaluate the following (show expansion):

a)  $(36)^{1/2}$   
 $\sqrt{36} = \boxed{6}$

b)  $(8x^6y)^0$   
 $\boxed{1}$

c)  ${}^3\sqrt{-125} = \boxed{-5}$

d)  $8x^6y^0$   
 $\boxed{8x^6}$

e)  $\sqrt[4]{-16}$   
 $\boxed{\text{No IR sol.}}$

f)  $\sqrt{\frac{49}{144}} = \boxed{\frac{7}{12}}$

g)  $(-xyz)^{-1}$   
 $\frac{-1}{xyz}$

h)  $-xyz^{-1}$   
 $\frac{-xy}{z}$

i)  $-25/0 = \boxed{\text{undefined}}$

3. Evaluate using order of operations (show all work; each step in order of op.)

a)  $1 + 30 \div 5 \cdot 2 - 18$

$= 1 + 12 - 18$

$= 13 - 18$

$= -5$

b)  $\frac{-2|6-24| \div 4 + 3}{-6^2 + 75 - (-4-2)^2}$

$= \frac{-2(18) \div 4 + 3}{-36 + 75 - 36} = \frac{-36 \div 4 + 3}{-72 + 75}$

$= \frac{-9 + 3}{3} = \frac{-6}{3} = -2$

4. Use  $<$ ,  $>$  or  $=$  to compare the following. Show all work to get one number to compare to another!

a)  $-|-4|$   $<$   $-(-4)$   
 $\rightarrow 4$   $\rightarrow 4$   
 $-4$   $4$   
 $-4 < 4$

b)  $-3^2$   $<$   $(-3)^2$   
 $-(3 \cdot 3)$   $-3 \cdot -3$   
 $-9$   $9$   
 $-9 < 9$

c)  $(2\frac{1}{2})(1\frac{1}{2})$   $=$   $2\frac{1}{2} \div \frac{2}{3}$   
 $\frac{5}{2} \cdot \frac{3}{2} = \frac{15}{4}$   $\frac{5}{2} \cdot \frac{3}{2} = \frac{15}{4}$

d)  $(\frac{5}{6} - 1\frac{1}{3})$   $<$   $(-\frac{1}{5} \div \frac{2}{3})$   
 $\frac{5}{6} - 1\frac{2}{6}$   $-\frac{1}{5} \cdot \frac{3}{2} = -\frac{3}{10}$   
 $-\frac{1}{6}$   $-\frac{3}{10}$   
 $-\frac{1}{6} > -\frac{3}{10}$

5. Solve the following for "e"

$f = \frac{d - 5e}{6}$

$6f = d - 5e \Rightarrow -5e = 6f - d$   
 $\Rightarrow e = \frac{6f - d}{-5} = \frac{d - 6f}{5}$

6. A banquet server is paid \$2.63 per hour plus 15% of the total cost of the food and beverages served during the banquet. If, during a 5 hour shift, the server earned \$400, what was the total cost of the food and beverages served? (Setup but don't solve.)

Setup  $\left\{ \begin{array}{l} \text{Pay} = \$2.63(\text{hr}) + 0.15(\text{Total Food}) = \$400 \\ \text{Hr.} = 5\text{hr.} \\ \text{Total Food} = x \end{array} \right.$

$2.63(5) + 0.15x = 400$   
 $13.15 + 0.15x = 400$

7. Solve.

a)  $5x - 3(x - 7) = 7(x + 2)$

$5x - 3x + 21 = 7x + 14$   
 $2x + 21 = 7x + 14$   
 $-2x = -2x + 14$

$21 - 5x + 14 = 7x + 14$   
 $-14 - 14 = 7x - 5x$   
 $-28 = 2x$   
 $x = -14$

b)  $3(x - 5) = 5(x + 2) - 2x$

$3x - 15 = 5x + 10 - 2x$   
 $3x - 15 = 3x + 10$

$\boxed{\phi}$

8. Clear and then solve the following:

$\frac{4}{3}x - 6 = 5 + \frac{4}{5}x - \frac{7}{5}$  Clear  $\times 15$

$20x - 90 = 75 + 12x - 21$   
 $20x - 90 = 54 + 12x$   
 $-12x = 54 + 12x - 12x$   
 $-12x - 12x = 54$   
 $-24x = 54$   
 $x = -2.25$

$8x - 90 = 54$   
 $+90 = +90$   
 $8x = 144$   
 $x = 18$

9. Simplify.

$\frac{3}{12} - \frac{4}{12}$

$\frac{1}{4}x^2 - \frac{2}{3}(\frac{1}{2}x^2 - \frac{2}{3}x) - 1$

$\frac{1}{4}x^2 - \frac{1}{3}x + \frac{4}{9}x - 1$

$\frac{1}{12}x^2 + \frac{4}{9}x - 1$

No Clearing!

10. Write in standard notation:

a)  $1.02 \times 10^{-4}$

$0.000102$  left 4

b)  $-1.25 \times 10^6$

$-1,250,000$  right 6 still neg

11. Write in scientific notation:

a)  $-0.0552$

$-5.52 \times 10^{-2}$  neg exp neg still

b)  $9,250,000$

$9.25 \times 10^6$  Positive exp 6

12. Multiply using exponents rules & write in correct scientific notation. Do not multiply in standard form.

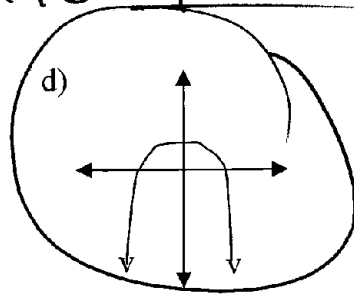
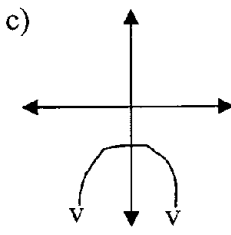
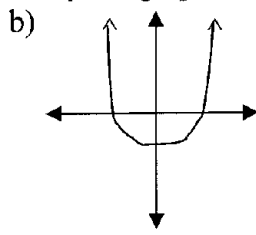
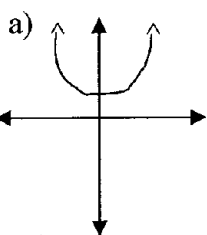
$(1.2 \times 10^7)(9 \times 10^{-2})$

$10.8 \times 10^5$

$1.08 \times 10^6$

13. Which is most likely the graph of

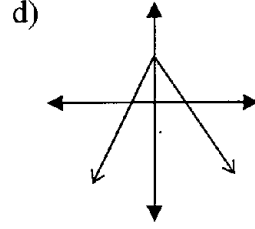
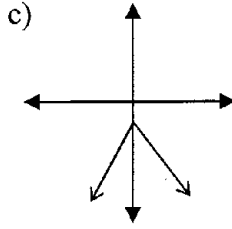
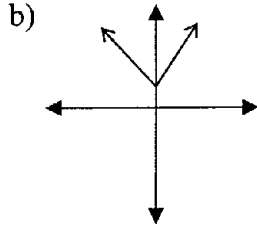
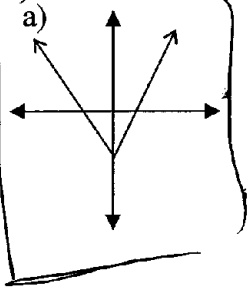
$y = -x^2 + 1$



neg positive y-int

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

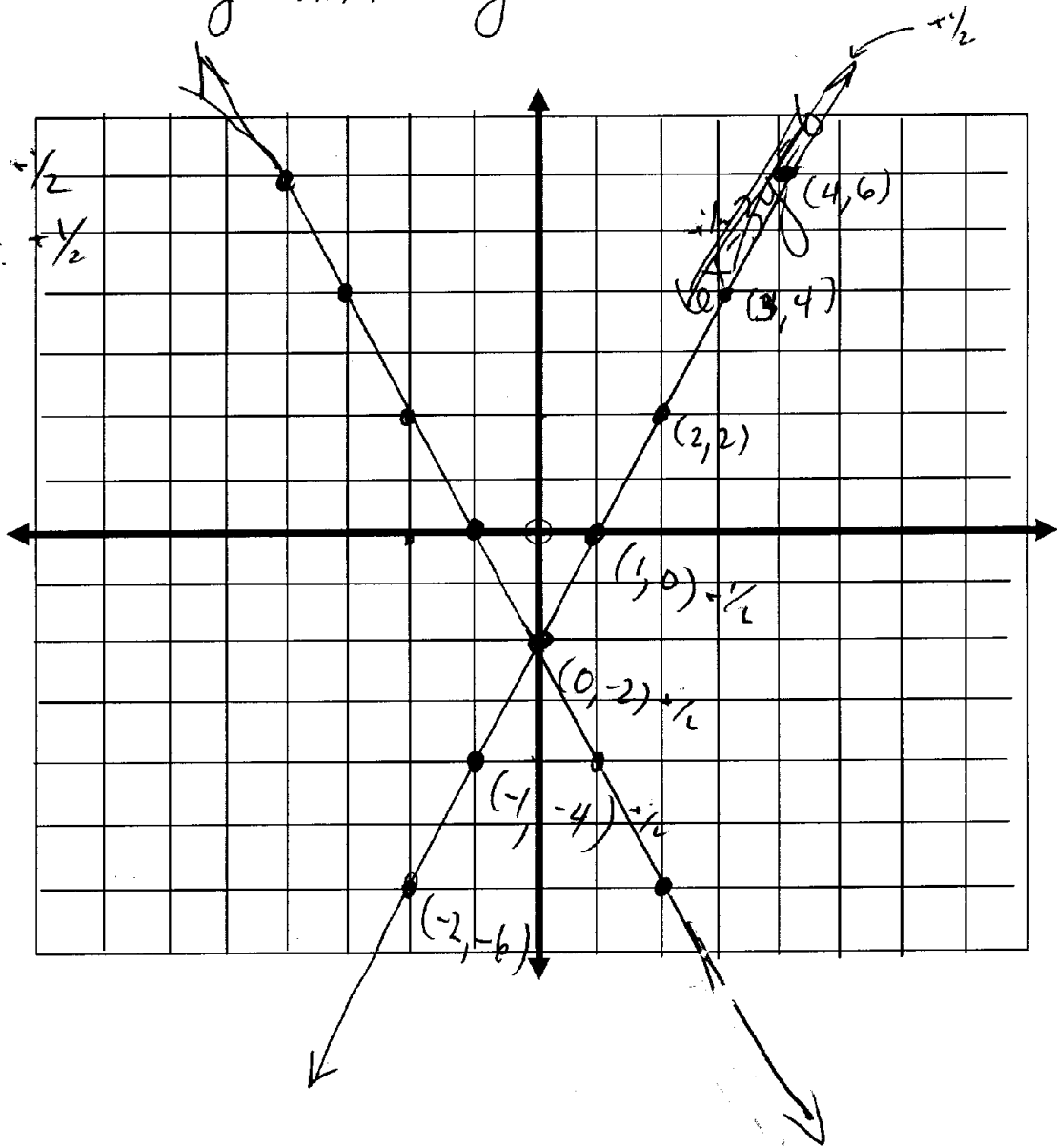
14. Which is most likely the graph of  $y = |x| - 2$



15. Graph the following equation. Don't forget to label the graphs with its equation.

$6x - 3y = 6$  (Make sure to use 3 points and label them.)

$-3y = -6x + 6 \Rightarrow y = 2x - 2$



$+4\frac{1}{2}$