

Math 141: Intermediate Algebra  
Worksheet 1  
Oct 3, 2007

1. *Simplify*

$$\left[ \frac{x^2 y^{-4} z}{x^{-5} y z^3} \right]^{-1} \quad (1)$$

2. *Simplify*

$$\left[ \frac{x^{-a} y^b z}{x^{2a} y^{-p} z^{-q}} \right] \quad (2)$$

3. Is  $x^{-2} < x^{-1}$  for any negative value(s) of  $x$ ? Why or why not?
4. A child breaks open her piggy bank and counts the number of quarters and dimes she finds.
- (a) She has 25 quarters and dimes put together. Write an algebraic expression for the number of quarters she has and for the number of dimes she has. Be sure to state clearly what your variable represents.
  - (b) Write algebraic expressions for the total amount of money she has. What is the largest value it could have? What is the smallest value? Explain both in words and in mathematical terms.
  - (c) Suppose she has \$4.30 total. How many quarters does she have? How many dimes?
5. One parsec is about 3.26 light-years and 1 light-year is about  $5.88 \times 10^{12}$  miles.
- (a) Find the number of miles in 1 parsec.
  - (b) If the Earth has a diameter of 8000 miles, around how many parsecs is the Earth's circumference?
  - (c) If the nearest star to our Sun is 4.2 light-years away, how many Earth diameters is that?
6. What is  $\sqrt{a^2}$ ?
7. Are the parentheses necessary in the expression  $4 \cdot 25 \div (10 - 5)$ ? Why or why not?
8. A farmer is fencing off a rectangular plot of land that is twice as long as it is wide. He has 600 meters of fence available.
- (a) What is the largest area he can enclose?
  - (b) Suppose one of the long sides of the plot is against a river and thus does not need to be fenced. In that case what is the largest area that the farmer can enclose?
  - (c) If the farmer used twice as much fencing, how many times more area could he enclose?