Without Graphing tell the number of solutions to each system of equations.

1. $4x - 12y = 24$
   $6x - 2y = 4$

ONE

$y = \frac{24 - 4x}{-12}$

$y = -2 + \frac{1}{3}x \quad m = \frac{1}{3}$

$y = \frac{4 - 6x}{-2} = -2 + 3x$

2. $y = 5$ Horiz
   $20x - 4y = 12$ NOT Horiz

$y = 5x - 3$

ONE

You fly roundtrip between two cities that are 1200 miles apart. On the first trip you fly with a tailwind in 8 hours. On the return trip you took 10 hours because of a headwind. Write and solve a system of equations to find the speed of the plane and the speed of the wind.

$\frac{1200}{8} = \frac{8(p+w)}{8}$

$\frac{1200}{10} = \frac{10(p-w)}{10}$

$150 = p + w$

$+ \quad 120 = p - w$

$270 = 2p$

$135 \text{ mph} = p$

$w = 15 \text{ mph}$

You start a carpet cleaning business. To begin you must spend $28,000 on equipment. Each cleaning job costs $8 in supplies and $45 in wages. If you charge $99 per job find the number of jobs you must complete in order to break-even.

Expense	Income
28,000	99j
8j	
45j	

$28{,}000 + 53j = 99j$

$-53j \quad -53j$

$\frac{28000}{46} = \frac{46j}{46}$

$609 = j$

Write a system of equations that has the following solution: (5,-1)

Chapter 8

Exponents and Exponential Functions

Find the value of each power of 2.

$2^4 =$	16
$2^3 =$	8
$2^2 =$	4
$2^1 =$	2
$2^0 =$	1
$2^{-1} =$	$0.5 = \frac{1}{2} = \frac{1}{2^1}$
$2^{-2} =$	$0.25 = \frac{1}{4} = \frac{1}{2^2}$

Zero as an exponent:

$a^0 = 1 \quad a \neq 0$

Negative Exponents

Reciprocal

$a^{-n} = \frac{1}{a^n}$

Simplify. Write answer without zero or negative exponents.

1. $w^{-3} = \frac{1}{w^3}$

2. $c^0 d^4 e^{-2} = \frac{1 \cdot d^4}{e^2} = \frac{d^4}{e^2}$

3. $\frac{6}{Q^{-5}}$

4. $\frac{-2m^{-1}}{n^3}$