HW#3 - Due Tuesday, 09/08:

3.1 - #3-29 odd	ordered pairs, distance, midpoint
3.2 - #3-16 all, 21-43 odd, 49-87 odd	functions, domain, range

HW#4 - Due Friday, 09/11:

3.3 - #3-9 odd, 15-33 odd	graph by plotting points, x- and y-intercepts
3.4 - #3-19 odd, 29-41 odd	finding slope, graph using slope and y-intercept
3.5 - #3-49 odd	finding equations of lines
4.1 - #9,11,13,15,29,37,43,49	solving systems with graphing and substitution
4.2 - #9,13,17,25,27,31,35	solving systems with elimination

Test #2 - MONDAY, 9/14

Review:

1. Solve the system of equations
$\begin{cases} 3x-6y=6 \\ 9x-3y=8 \end{cases}$ $\cdot -2 \rightarrow -18x+6y=-16$

$-15x = -10$

$x = \frac{2}{3}$

$3(\frac{2}{3})-6y=6$

$2-6y=6$

$-6y=4$

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

$(\frac{2}{3}, -\frac{2}{3})$

2. Evaluate $f(-2)$ when $f(x)=-3x^2-2x+5$

$f(-2)=-3(-2)^2-2(-2)+5$

$=-3(4)+4+5$

$=-12+9=\boxed{-3}$

15. Find the distance between the points $P_1(3,-5)$ and $P_2(6,0)$.

$d=\sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$

$=\sqrt{(3-6)^2+(-5-0)^2}$

$=\sqrt{(-3)^2+(-5)^2}=\sqrt{9+25}=\boxed{\sqrt{34}}$

16. Find the midpoint of the line segment between the points $P_1(-3,5)$ and $P_2(2,-4)$.

$(x_m, y_m)=\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$

$=\left(\frac{-3+2}{2}, \frac{5+(-4)}{2}\right)$

$=\boxed{\left(-\frac{1}{2}, \frac{1}{2}\right)}$

1. State the formula for the distance between two points, (x_1, y_1) and (x_2, y_2).

Are the following relations functions? (yes or no)

2. $\{(-1,3),(2,4),(5,-3),(6,2),(3,-1),(-2,4)\}$

yes

3. $\{(1,2),(2,3),(3,4),(4,5),(5,1),(1,5),(4,2)\}$

NO

4. What value(s), if any, are excluded from the domain of the function?

$$f(x) = \frac{x+1}{x-3}$$

$\{3\}$

Bonus: state the domain of the function using interval notation.

$(-\infty, 3) \cup (3, \infty)$

5. Find the range of the function for the given domain. (list using the roster method)

$$f(x) = \frac{4}{1-x}; \ domain = \{-3,0,3\}$$

$f(-3) = 1$
$f(0) = 4$
$f(3) = -2$

$\{-2, 1, 4\}$

Match the form of the equation of a line with its name:

B 6. Standard form — a. $y - y_1 = m(x - x_1)$

C 7. Slope-intercept form — b. $Ax + By = C$

A 8. Point-slope form — c. $y = mx + b$

9. Find the slope of the line that passes through the points $(-3,7)$ and $(5,-1)$.

$\frac{7-(-1)}{-3-5} = \frac{8}{-8} = -1$

10. Given the line $y = \frac{1}{5}x + 7$, what is the slope of a line perpendicular to it?

-5

11. What is the x-intercept of the line represented by the equation $2x + 3y = 6$?

$2x + 3(0) = 6$

$x = 3$

$(3,0)$

12. What is the y-intercept of the line represented by the equation $2x + 3y = 6$?

$2(0) + 3y = 6$

$y = 2$

$(0,2)$

13. What is the equation of the line passing through the point $(5,-7)$ whose slope is undefined?

$x = 5$

Ch 5 - Exponential Expressions & Polynomials

Due Tuesday, 9/15:
5.1 #63-85 odd

Test #2 - MONDAY, 9/14
on Chapters 3&4, plus review!

5.2 #3-7odd, 15-25odd, 35-49odd
5.3 #25-29odd, 43-51odd, 61-67odd, 89-97odd, 109-117odd
5.4 #19-25 odd; 27-43 odd; 55-61 odd
5.5 #21-47 odd

*Math Lab WILL be open on
Sunday, 9/13, 7-9pm in S201

5.1 Exponential Expressions

$x^n = \underbrace{x \cdot x \cdot x \cdot x \cdots x}_{n \text{ times}}$

For $m, n, p \in \mathbb{Z}$ (integers),

$x^m x^n = x^{m+n}$

$\frac{x^m}{x^n} = \frac{x^{m-n}}{1} = \frac{1}{x^{n-m}}$

$(x^m)^n = x^{m \cdot n}$

$(x^m y^n)^p = x^{m \cdot p} y^{n \cdot p}$

$\left(\frac{x^m}{y^n}\right)^p = \frac{x^{m \cdot p}}{y^{n \cdot p}}$, $y \neq 0$

$x^0 = 1$, $x \neq 0$

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

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

0^0 is an indeterminate form (like $\frac{0}{0}$)

A simplified exponential expression contains:
- only one instance of each variable
- no negative exponents

4. $(-2ab^4)(-3a^2b^4) = (-2)(-3)a^1a^2b^4b^4 = 6\cdot a^{1+2}b^{4+4} =$
$= 6a^3b^8$

20. $[(3x^2y^3)^2]^2$ $= [3^2(x^2)^2(y^3)^2]^2 = [9x^4y^6]^2$
$= 9^2(x^4)^2(y^6)^2 = 81x^8y^{12}$

$= [3x^2y^3]^4 = 3^4x^8y^{12} = 81x^8y^{12}$

66. $\dfrac{6^2a^{-2}b^3}{3ab^4} = \dfrac{36}{3\cdot a^{1-(-2)}b^{4-3}} = \dfrac{3\cdot 12}{3a^{1+2}b^1}$

$= \dfrac{12}{a^3b}$

$\dfrac{b^3}{b^4} = \dfrac{b^{3-4}}{1} = \dfrac{1}{b^{4-3}}$

72. $\left(\frac{x^{-3}y^{-4}}{x^{-2}y}\right)^{-2} = \frac{(x^{-3})^{-2}(y^{-4})^{-2}}{(x^{-2})^{-2}(y)^{-2}} = \frac{x^{6}y^{8}}{x^{4}y^{-2}} =$

$= \frac{x^{6-4}y^{8-(-2)}}{1} = \boxed{x^{2}y^{10}}$

OR

$\left(\frac{x^{-3-(-2)}}{y^{1-(-4)}}\right)^{-2} = \left(\frac{x^{-1}}{y^{5}}\right)^{-2} = \frac{x^{2}}{y^{-10}} = x^{2}y^{10}$

80. $\left(\frac{4^{-2}xy^{-3}}{x^{-3}y}\right)^{3}\left(\frac{8^{-1}x^{-2}y}{x^{4}y^{-1}}\right)^{-2}$

$= \frac{4^{-6}x^{3}y^{-9}}{x^{-9}y^{3}} \cdot \frac{8^{2}x^{4}y^{-2}}{x^{-8}y^{2}}$

$= \frac{(2^{2})^{-6}x^{3-(-9)}}{y^{3-(-9)}} \cdot \frac{(2^{3})^{2}x^{4-(-8)}}{y^{2-(-2)}}$

$= \frac{2^{-12}x^{12}}{y^{12}} \cdot \frac{2^{6}x^{12}}{y^{4}}$

$= \frac{2^{-6}x^{12+12}}{y^{12+4}} = \frac{x^{24}}{2^{6}y^{16}} = \boxed{\frac{x^{24}}{64y^{16}}}$

$\frac{4^{-6}x^{24}8^{2}}{y^{16}} = \frac{8^{2}x^{24}}{4^{6}y^{16}}$

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

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

$x^{n}x^{m} = x^{n+m}$

$\frac{x^{n}}{x^{m}} = \frac{x^{n-m}}{1} = \frac{1}{x^{m-n}}$

$(x^{m})^{n} = x^{mn}$

$\frac{(2^{3})^{2}}{(2^{2})^{6}} = \frac{2^{6}}{2^{12}} = \frac{1}{2^{6}}$

80. $\left(\frac{4^{-2}xy^{-3}}{x^{-3}y}\right)^{3}\left(\frac{8^{-1}x^{-2}y}{x^{4}y^{-1}}\right)^{-2}$

$$=\left(\frac{x^{1-(-3)}}{4^{2}y^{1-(-3)}}\right)^{3}\left(\frac{y^{1-(-1)}}{8^{1}x^{4-(-2)}}\right)^{-2}$$

$$=\left(\frac{x^{4}}{16y^{4}}\right)^{3}\cdot\left(\frac{y^{2}}{8x^{6}}\right)^{-2}$$

$$=\frac{x^{12}}{16^{3}y^{12}}\cdot\frac{y^{-4}}{8^{-2}x^{-12}}=\frac{8^{2}x^{12-(-12)}}{16^{3}y^{12-(-4)}}\cdots$$