

Chapter One

Note: Show all work. Unless a problem is marked with an asterisk (\*), use a calculator only to check.

1. Simplify:  $\left(\frac{x^3 y^{-5} z^{-2}}{x^5 y z^{-4}}\right)^{-2}$  (Assume no variables are equal to zero.) (4 points)

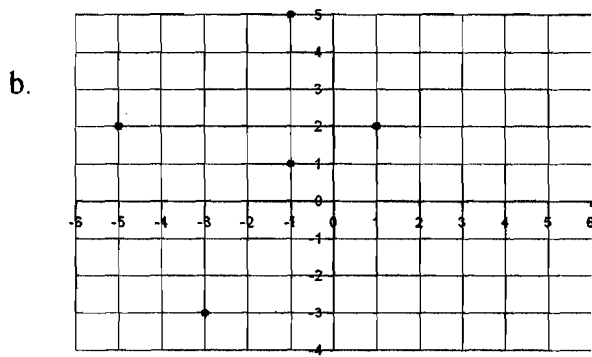
$$\left(x^{3-5} y^{-5-1} z^{-2-(-4)}\right)^{-2} = \left(x^{-2} y^{-6} z^2\right)^{-2} = x^{+4} y^{+12} z^{-4} = \frac{x^4 y^{12}}{z^4}$$

- \*2. If  $S = \frac{4}{3}\pi r^3$  find S when  $r = 6$ . (2 points)

$$S = \frac{4}{3}\pi(6)^3 = 288\pi$$

3. Find the domain and range of each relation. (2 points)

- a.  $\{(1,2)(3,4)(5,6)(7,8)(9,10)\}$  Domain:  $\{1,3,5,7,9\}$   
 Range:  $\{2,4,6,8,10\}$



Domain:  $\{-5, -3, -1, 1\}$

Range:  $\{-3, 1, 2, 5\}$

c.

x	1	2	3	4	5
y	1	6	3	3	3

Domain:  $\{1, 2, 3, 4, 5\}$

Range:  $\{1, 6, 3\}$

\*4. Evaluate with your calculator and answer to the appropriate number of significant digits. (2 points)

a.  $\frac{5 \pm \sqrt{120}}{6(14)}$   $\rightarrow \frac{5 + \sqrt{120}}{84} = 0.18993 = 2 \times 10^{-1}$   
 $\rightarrow \frac{5 - \sqrt{120}}{84} = -0.070886 = -7. \times 10^{-2}$

b.  $5432.01(1 + \frac{0.032}{12})^{12(3)}$  Assume this is a calculation involving money.

$\$ 5978.57$

5. Solve the following algebraically  $13 - 2x = \frac{1}{3}x + 7$  (2 points)

Multiply both sides by 3

$$39 - 6x = x + 21$$

$$\begin{array}{r} -7x = 21 - 39 \\ -7x = -18 \end{array}$$

Solve:

$$\Rightarrow x = \frac{18}{7}$$

(2 points Each)

6.  $3x - (2x - 5) = 4(2x + 7)$

7.  $t^2 - 6t + 5 = 0$

$$3x - 2x + 5 = 8x + 28$$

$$(t - 5)(t - 1) = 0$$

$$x + 5 = 8x + 28$$

$$-23 = 7x \Rightarrow x = \frac{-23}{7}$$

$$t = 5 \quad t = 1$$

8. For the line  $7x - 3y = 9$ , find the (4 points)

a. slope  $\frac{7}{3}$   $-3y = -7x + 9 \Rightarrow y = \frac{-7}{-3}x + \frac{9}{-3}$

b. y-intercept  $(0, -3)$

$$y = \frac{7}{3}x - 3$$

c. x-intercept  $(\frac{9}{7}, 0)$

Math 103 Professor Katiraie Quiz One Form B

Name \_\_\_\_\_

Chapter One

Note: Show all work. Unless a problem is marked with an asterisk (\*), use a calculator only to check.

1. Simplify:  $\left(\frac{x^3y^{-5}z^{-2}}{x^5yz^{-4}}\right)^{-1}$  (Assume no variables are equal to zero.) (4 points)

$$(x^{-2}y^{-6}z^2)^{-1} = x^2y^6z^{-2} = \frac{x^2y^6}{z^2}$$

- \*2. If  $S = \frac{4}{3}\pi r^3$  find S when  $r = 3$ . (2 points)

$$S = \frac{4}{3}\pi(3)^3 = 36\pi$$

3. Find the domain and range of each relation. (2 points)

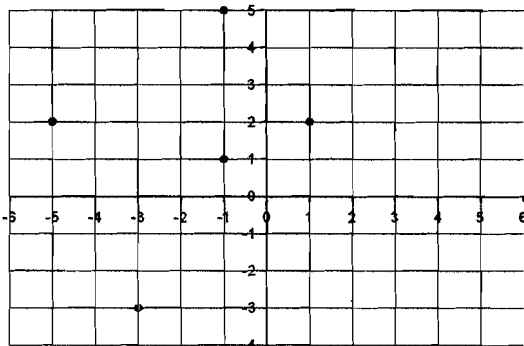
- a.  $\{(1,2)(3,4)(0,6)(7,8)(0,10)\}$  Domain:

$$\{0, 1, 3, 7\}$$

Range:

$$\{2, 4, 6, 8, 10\}$$

b.



Domain:

$$\{-5, -3, -1, 1\}$$

Range:

$$\{-3, 1, 2, 5\}$$

c.

x	1	2	3	4	5
y	9	3	3	3	3

Domain:

$$\{1, 2, 3, 4, 5\}$$

Range:

$$\{3, 9\}$$

\*4. Evaluate with your calculator and answer to the appropriate number of significant digits. (2 points)

a.  $\frac{5 \pm \sqrt{129}}{6(14)}$

$0.195 \cong 2. \times 10^{-1}$   
 $-0.0757 \cong 8. \times 10^{-2}$

b.  $5432.01(1 + \frac{0.042}{12})^{12(7)}$  Assume this is a calculation involving money.

7284.84

5. Solve the following algebraically  $3 - 5x = \frac{1}{3}x + 7$  (2 points)

Multiply both sides by 3

$$\begin{array}{r} 9 - 15x = x + 21 \\ -x \quad -x \\ \hline \end{array}$$

$9 - 16x = 21$

$-16x = 21 - 9$

$-16x = 12 \Rightarrow x = \frac{12}{-16} = \frac{-3}{4}$  (2 points Each)

Solve:

6.  $3x - (2x - 5) = 4(x + 7)$

$3x - 2x + 5 = 4x + 28$

$x + 5 = 4x + 28$

$-x - 23 = -x - 23$

$-23 = 3x \Rightarrow x = \frac{-23}{3}$

7.  $t^2 - 7t + 12 = 0$

$(t - 3)(t - 4) = 0$

$t = 3$   $t = 4$

8. For the line  $7x - 2y = 14$ , find the (4 points)

a. slope =  $\frac{7}{2}$   $-2y = -7x + 14$

$y = \frac{-7}{-2}x + \frac{14}{-2} = \frac{7}{2}x - 7$

b. y-intercept  $(0, -7)$  To find y-intercept let  $x = 0$  and solve for  $y$

c. x-intercept  $(2, 0)$  To find x-intercept let  $y = 0$  and solve for  $x$