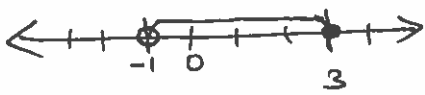


Show all your work to get full/partial credit. Each question (as well as part) is worth 5 points, but # 5 (both parts) is worth 5 points.

1. Given the interval,  $(-1, 3]$ , graph the set and write the set in set-builder notation.



$\{x \mid -1 < x \leq 3\}$

2. Your power company charges \$0.10 per kilowatt-hour (kWh) used and \$15.50 in monthly taxes.

- a. Write a formula for the monthly charge  $C$  if you use  $k$  kilowatt-hours.

$C = 0.10k + 15.50$

- b. If you use 1,000 kWh this month, what will the monthly charge be?

$C = 0.10 \cdot 1000 + 15.50 = 100 + 15.50 = \$115.50$

3. Simplify:  $3 - 2[7x + 3 - 4(x - 2y)]$ .  
 The monthly charge will be \$115.50 if 1000 kWh is used.

$= 3 - 2[7x + 3 - 4x + 8y]$

$= 3 - 2[3x + 3 + 8y]$

$= 3 - 6x - 6 - 16y = -6x - 16y - 3$

4. Simplify and write the answer with positive exponents only:  $(-4w^{-2}z)^{-2}(3w^{-6}y^0z^4)^3$ .

$(-4)^{-2} (w^{-2})^{-2} z^{-2} 3^3 (w^{-6})^3 (y^0)^3 (z^4)^3$

$= \frac{1}{(-4)^2} w^{-4} z^{-2} 3^3 w^{18} y^0 z^{12}$

$= \frac{3^3}{4^2} w^{18-4} y^0 z^{12-2} = \frac{3^3}{4^2} w^{14} y^0 z^{10} = \frac{3^2 z^{10}}{4^2 w^{22}}$

5. Write the following numbers in scientific notation.

a. 0.0000356

$3.56 \times 10^{-5}$

b. 12400

$1.24 \times 10^4$

6. Write the following expressions using radical notation and simplify if possible.

a.  $(-8)^{\frac{2}{3}} = ((-8)^2)^{\frac{1}{3}} = \sqrt[3]{64}$

b.  $7t^{\frac{3}{5}} = 7(t^3)^{\frac{1}{5}}$

$= \sqrt[3]{4^3} = 4$

$= 7\sqrt[5]{t^3}$

Completely factor #s 7 and 8:

7.  $ab + 4a - 8b - 2b^2$

$= a(b+4) - 2b(4+b)$

$= (b+4)(a-2b)$

8.  $2x^2 + x - 10$

$= 2x^2 + 5x - 4x - 10$

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

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

9. a. Simplify:  $\frac{4}{x^2-9} - \frac{1}{x-3}$

$$= \frac{4}{(x+3)(x-3)} - \frac{1}{x-3}$$

$$= \frac{4 - (x+3)}{(x+3)(x-3)} = \frac{4-x-3}{(x+3)(x-3)} = \frac{1-x}{(x+3)(x-3)}$$

For restricted values of  $x$   
 $(x+3)(x-3) \neq 0$   
 $x \neq 3, -3$

b. And, state any restrictions on the variable  $x$ .

10. Check (show work) if the following equation is conditional, contradiction, or identity.

$$4(3-5w)+1 = -4w-8-16w$$

$$12-20w+1 = -4w-8-16w$$

$$13-20w = -20w-8 \Rightarrow -20w+20w = -8+13$$

11. Solve  $A = P + Prt$  for  $P$ .

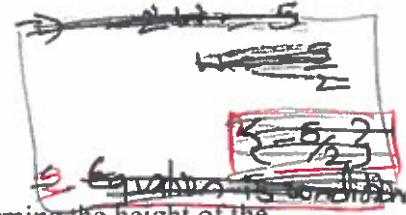
$$A = P(1+rt)$$

$$P = \frac{A}{1+rt}$$

$$\Rightarrow 0 = 5$$

$$= \{ \}$$

A Contradiction



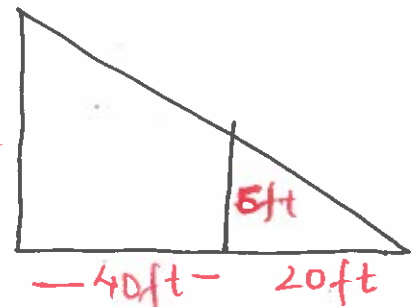
12. A 6 ft man is standing 40 ft from a light post. If the man's shadow is 20 ft, determine the height of the light post.

Let,  $x$  be the height of the light post

$$\frac{6}{20} = \frac{x}{40+20}$$

$$\frac{6}{20} = \frac{x}{60} \Rightarrow 20x = 360 \text{ xft}$$

$$x = 18 \text{ ft}$$



Simplify the following:

13.  $\sqrt{75ab^4}$

$$= (3 \cdot 5^2 \cdot a \cdot (b^2)^2)^{1/2}$$

$$= (3a)^{1/2} (5b^2)^{2 \cdot 1/2}$$

$$= \sqrt{3a} \cdot 5b^2 = 5b^2\sqrt{3a}$$

14.  $(3y)(\frac{1}{3}y^2 - 4y - 2)$

$$= 3y \cdot \frac{1}{3}y^2 - 3y \cdot 4y - 3y \cdot 2$$

$$= y^3 - 12y^2 - 6y$$

15.  $(2x - \sqrt{3})^2$

$$= (2x)^2 - 2 \cdot 2x\sqrt{3} + (\sqrt{3})^2$$

$$= 4x^2 - 4\sqrt{3}x + 3$$

16.  $\sqrt{\frac{8}{2y}}$  (don't forget to rationalize the denominator)

$$= \frac{\sqrt{8}}{\sqrt{2y}}$$

$$= \frac{2\sqrt{2}}{\sqrt{2y}} \cdot \frac{\sqrt{2y}}{\sqrt{2y}}$$

$$= \frac{2 \cdot \sqrt{2} \cdot \sqrt{2y}}{2y} = \frac{2\sqrt{y}}{y}$$

17.  $\frac{17-4+(5-2)^2}{\sqrt{4^2-7}}$

$$= \frac{13+3^2}{\sqrt{16-7}}$$

$$= \frac{3+9}{\sqrt{9}} = \frac{12}{3} = 4$$