

# Semester 1 Review: P Chapter

Pre-Calculus | Mr. Hurni

Key Concepts: All of these are VERY IMPORTANT

1. The 5 Exponent Rules	2. Notations: (Interval, Inequality, Graphical)
3. Fraction Busters	4. Solve Inequalities
5. Forms of a Line (Point-Slope and Slope-Intercept)	6. Imaginary Numbers
7. Circles	9. Projectile Motion
8. Solve Quadratics (Factor, Extract the Square, Complete the Square, Quadratic Formula)	

## 1. The 5 Exponential Rules

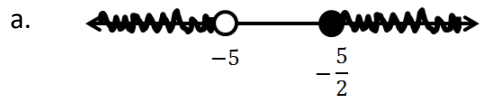
a.  $\left(\frac{3}{y^6}\right)^{-2} \left(\frac{x^2y^4}{x^6y^{12}}\right)^3$

b.  $\frac{(2x^3)^2z^5}{2z^9}$

c.  $\frac{(uv^2)^3}{u^2v^3}$

d.  $(3x^2y^3)^{-2}$

## 2. Notations: Write the solutions in Interval, Inequality, and Graphical Notations



b.  $-2x \leq 10$

c.  $x = [2, 6.2)$

d.  $-\frac{4}{3} \geq x > -\frac{1}{2}$

## 3. Fraction Busters

a.  $\frac{t+4}{6} + \frac{t-3}{3} = \frac{1}{2}$

b.  $\frac{p-6}{5} + \frac{p-2}{10} = \frac{3}{2}$

c.  $\frac{x}{x+1} - \frac{3}{x-2} = \frac{4x}{x^2-x-2}$

d.  $\frac{2}{6x^2+x-1} + \frac{2x}{3x-1} = \frac{3x}{2x+1}$

4. Solve Inequalities

a.  $|4x - 6| < 22$

b.  $2|4 - 5x| > -3$

c.  $\frac{1}{2} \leq \frac{3x+1}{3} < \frac{3}{2}$

d.  $-4|x - 4| + 3 < -17$

5. Forms of a Line

a. Write the equation for a line that passes through the points:  $A(2, -7)$  and  $B(-3, -2)$

b. Write the equation of a line parallel to the line  $y = 5 - \frac{1}{2}x$  and through the point  $P(2, -1)$ .

c. Write the equation of a line perpendicular to the line  $4x - 5y - 7 = 0$  and through the point  $P(-2, \sqrt{3})$

d. Write the equation of a line perpendicular to the line  $y + 6 = 3(x - 2)$  and through the point  $P(10, -4)$

6. Imaginary Numbers: Simplify and Write in Standard Form

a.  $(3 - 4i)(2 + 3i)$

b.  $(1 - 5i)(3 - 3i)$

c.  $\frac{8i}{4+i}$

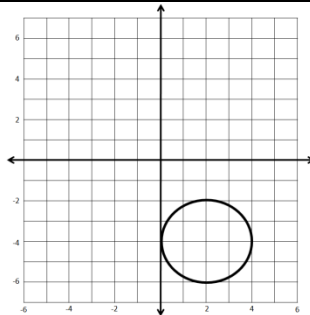
d.  $\frac{1-i}{-4i}$

e.  $i^{24} + i^{40}$

f.  $i^{101} - i^{75}$

7. Circles

a. Write the equation of the circle:



b. Write the equation of a circle that has a radius of  $5\text{ km}$  and a center at  $C(4,0)$

c. Write the equation of a circle that has a diameter of  $10\text{ cm}$  and a center at  $P(0,0)$

d. Write the equation of a circle that has a circumference of  $8\pi\text{ ft}$  and a center at  $P(-\sqrt{2}, 3)$

8. Projectile Motion:

$$y = at^2 + v_0t + y_0$$

- a. A projectile is launched straight up from the ground with an initial velocity of  $336 \frac{ft}{s}$ .  
When will its height be 704 feet above the ground?

- b. When will the projectile be higher than 704 feet?

9. Solving Quadratics

- a. Solve using extract the square method

$$4(2x + 12)^2 = 32$$

- b. Solve using Factoring

$$2x(x - 4) = 64$$

- c. Solve using Quadratic Formula

$$3x^2 - 2x = -5$$

- d. Choose your own adventure!

$$5(x - 12)^2 = 35$$

- e. Choose your own adventure!

$$x^2 + 3x - 2 = 4x + 11$$

- f. Choose your own adventure!

$$12x^2 - 5x - 2 = 0$$