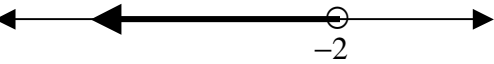


## Key Concepts Review Chapter P

1. Express number sets using interval notation, graphs, and inequalities.

- a) Express the interval  $[2, \infty)$  as an inequality, and then as a number line graph.
- b) Express  $\{x \mid -2 < x \leq 5\}$  using interval notation and then as a graph.
- c) Express  using interval notation and as an inequality.
- d) Express  $[-4, 0)$  as an inequality and a graph.
- e) Express  $\{x \mid x \leq -1\}$  using interval notation and then as a graph.

2. Find the intersection and union of two sets of numbers. Express your answers using interval notation.

Find i)  $A \cap B$  and ii)  $A \cup B$  for each of the following pairs of sets

- a)  $A = \{x \mid x < 3\}$  and  $B = \{x \mid -2 < x \leq 5\}$
- b)  $A = [-1, 6)$  and  $B = [5, 8]$
- c)  $A = \{x \mid x \leq 0\}$  and  $B = \{x \mid x < -3\}$
- d)  $A = (-\infty, 2]$  and  $B = [2, \infty)$
- e)  $A = [-1, \infty)$  and  $B = (1, 3]$

3. Simplify expressions involving rational exponents.

Simplify as much as possible and eliminate any negative exponents.

- a)  $(2x^4y^{\frac{4}{5}})^3(8y^2)^{\frac{2}{3}}$
- b)  $(27x^9)^{-\frac{4}{3}}$
- c)  $\frac{(y^9z^{-3})^{1/3}}{(y^{-4}z^2)^{1/4}}$
- d)  $\frac{(9st)^{\frac{3}{2}}}{(27s^3t^{-4})^{\frac{2}{3}}}$
- e)  $\left(\frac{3x^{\frac{3}{2}}y^3}{x^2y^{-\frac{1}{2}}}\right)$

4. Factor an expression involving rational exponents.

Ex: Factor completely.

a)  $x^{\frac{3}{2}} + 2x^{\frac{1}{2}} + x^{\frac{1}{2}}$       b)  $x^{-\frac{1}{2}}(x+1)^{\frac{1}{2}} + x^{\frac{1}{2}}(x+1)^{-\frac{1}{2}}$       c)  $4x^{-\frac{1}{2}} + 5x^{\frac{1}{2}} + x^{\frac{3}{2}}$

d)  $3(1+x)^{\frac{1}{3}} - x(1+x)^{-\frac{2}{3}}$       e)  $3x^{\frac{3}{2}} - 9x^{\frac{1}{2}} + 6x^{-\frac{1}{2}}$

5. Simplify a complex rational expression.

Ex: Simplify completely.

a)  $\frac{\frac{1}{t+h} - \frac{1}{t}}{h}$       b)  $\frac{1}{1+a^n} + \frac{1}{1+a^{-n}}$       c)  $x^2 - \frac{y^2}{\frac{1}{y^2} + \frac{1}{x^2}}$

d)  $\frac{1 + \frac{2}{c-2}}{1 - \frac{2}{c-2}}$       e)  $\frac{\frac{y}{x} - \frac{x}{y}}{\frac{1}{y} - \frac{1}{x}}$