

Algebra Review Worksheet

① a) $4x^{-3/4}(3-2x)$ b) $3(1-x^2)^{-3/2}(x^2+(1-x^2))$

$$\frac{4(3-2x)}{x^{3/4}} \qquad \frac{3}{(1-x^2)^{3/2}}$$

② a) $\frac{\frac{1}{x} + \frac{1}{y^2}}{\frac{1}{x^2} - \frac{1}{y}} \cdot \frac{x^2y^2}{x^2y^2}$ b) $\frac{(x^2+5)^{-1/2}(x(8x-1)-8(x^2+5))}{(8x-1)^2}$

$$\frac{xy^2+x^2}{y^2-x^2y} = \frac{x(y^2+x)}{y(y-x^2)}$$

$$\frac{-x-40}{(x^2+5)^{1/2}(8x-1)^2}$$

③ a) $\frac{x-2}{(x-4)(x+4)} \geq 0$ b) radicand ≥ 0

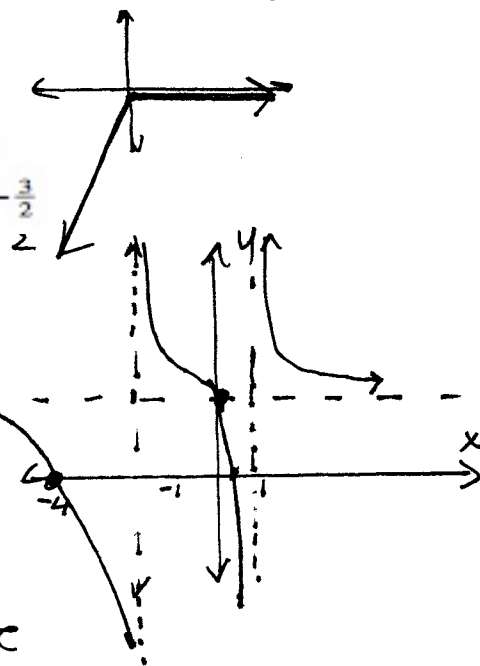
$(-4, 2] \cup (4, \infty)$

$3x^2 - 6x \geq 0$
 $3x(x-2) \geq 0$

$(-\infty, 0] \cup [2, \infty)$

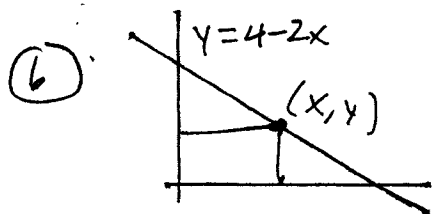
④ a) $f(x) = x - |x| = \begin{cases} x-x & \text{if } x \geq 0 \\ x-(-x) & \text{if } x < 0 \end{cases} = \begin{cases} 0 & \text{if } x \geq 0 \\ 2x & \text{if } x < 0 \end{cases}$

b) $|2x+3| = \begin{cases} 2x+3 & \text{if } 2x+3 \geq 0 \\ -(2x+3) & \text{if } 2x+3 < 0 \end{cases} = \begin{cases} 2x+3 & \text{if } x \geq -\frac{3}{2} \\ -(2x+3) & \text{if } x < -\frac{3}{2} \end{cases}$



⑤ $y = \frac{(2x-1)(x+4)}{(x+2)(x-1)}$

X-int: $(\frac{1}{2}, 0), (-4, 0)$ cross
 V.A.: $x = -2, 1$ approach opposite
 H.A.: $y = 2$ intersect at $x = 0$
 Y-int: $(0, 2)$



Maximize Area Rectangle

$$A = xy$$

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

$$A = 4x - 2x^2$$

max at vertex $x = \frac{-b}{2a} = \frac{-4}{2(-2)} = 1$

$$A(1) = 4 - 2 = 2$$

Max Area is 2 sq. units