

## Quiz 1 - 8/27/2019

(I) Sketch a graph of the function

$$f(x) = \begin{cases} 2 - x, & \text{if } x < 0 \\ 2 + x, & \text{if } 0 \leq x \leq 1 \\ x^2, & \text{if } x > 1 \end{cases}$$

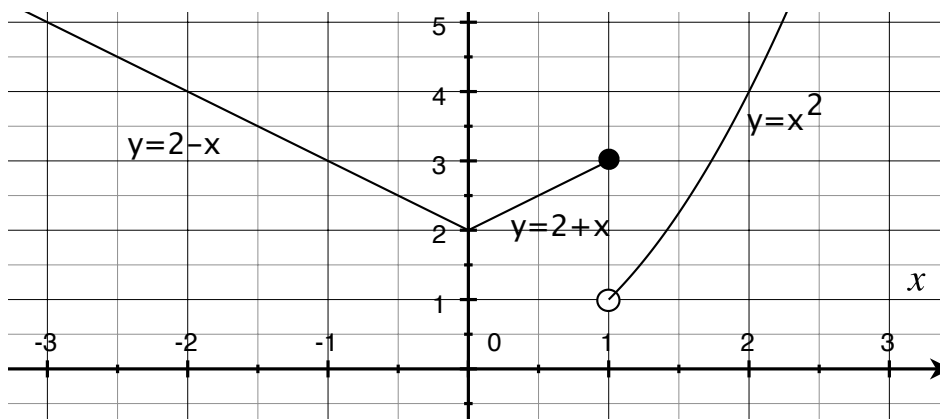
Graph must be neat, approximately to scale, include detailed labels, and indicate open/closed intervals wherever needed.

(II) Use the laws of exponents to simplify and rewrite the expression:

$$\frac{\sqrt{x y^4}}{\sqrt[3]{x y}}$$

### Solution

(I) The graph is shown below



(II) Rewrite square-roots and other roots to get

$$\frac{\sqrt{x y^4}}{\sqrt[3]{x y}} = \frac{(x y^4)^{1/2}}{(x y)^{1/3}} = \frac{x^{1/2} y^2}{x^{1/3} y^{1/3}} = x^{1/6} y^{5/3}$$

$$\text{Answer: } \frac{\sqrt{x y^4}}{\sqrt[3]{x y}} = x^{1/6} y^{5/3} \quad \text{OR} \quad \sqrt[6]{x} \sqrt[3]{y^5}$$

**Grading:** Total points possible = 6.

1 pt - Any reasonable attempt.

3.5 pt for (I): 1.5pt = correct shape and location of 3 pieces.

1pt = complete & clear labels on axes.

1pt = correct open/closed circles at  $x = 1$ .

1.5 pt for (II): 1pt = translate radicals to exponents correctly.

0.5pt = correctly simplify result.