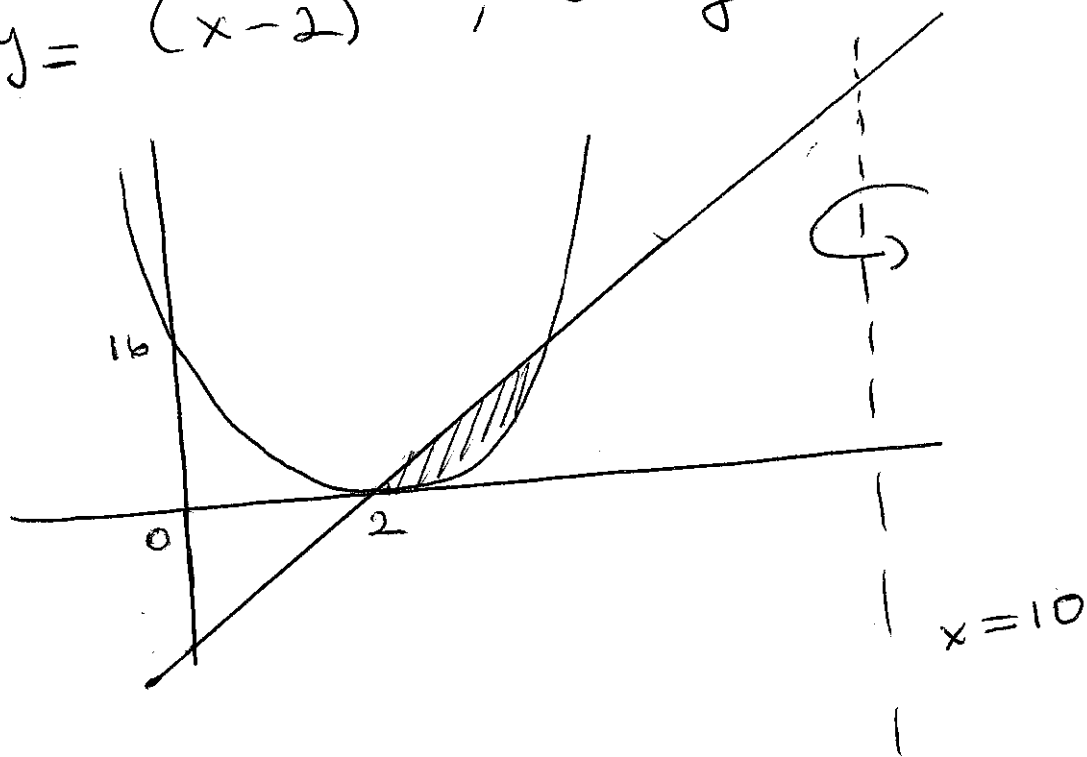


## Pop - Quiz #2

- ① Set up, but do not evaluate, an integral for the volume of the solid obtained by rotating the region bounded by the given curves about the specified line.

$$y = (x-2)^4, \quad 8x - y = 16, \quad \text{about } x=10$$



Intersection Points:

$$(x-2)^4 = 8x - 16 = 8(x-2) \Leftrightarrow$$

$$(x-2)^4 - 8(x-2) = 0 \Leftrightarrow$$

$$(x-2) \left[ (x-2)^3 - 8 \right] = 0 \Leftrightarrow$$

$$x-2=0 \Rightarrow \boxed{x_1=2} \text{ or } (x-2)^3=8$$

$$x-2=2$$

$$\boxed{x_2=4}$$

$$y = (x-2)^4 \Rightarrow x-2 = \sqrt[4]{y} \Rightarrow x = 2 + \sqrt[4]{y}$$

since  $x \geq 2$

$$8x - y = 16 \Rightarrow 8x = y + 16 \Rightarrow x = \frac{1}{8}y + 2$$

$$V = \pi \int_0^{16} \left[ \left( 10 - \left( \frac{1}{8}y + 2 \right) \right)^2 - \left( 10 - \left( 2 + \sqrt[4]{y} \right) \right)^2 \right] dy$$