1. Find the area of the region bounded by the curve $y = x^3$ and $y = 9x$, for $x \geq 0$.

Find where curves intersect:

$x^3 = 9x$

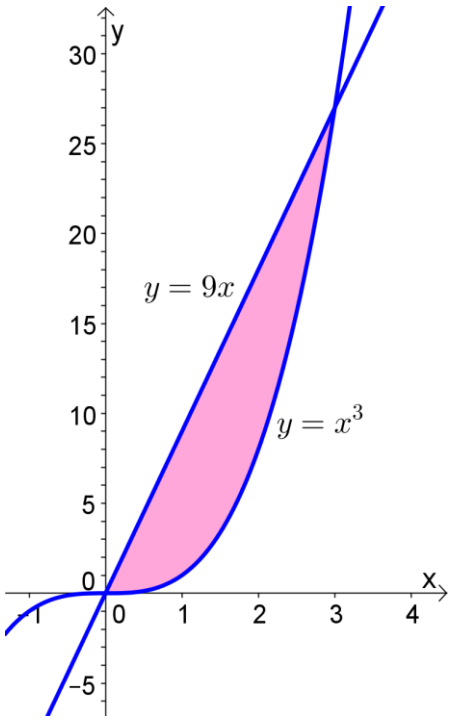
$x^3 - 9x = 0$

$x(x^2 - 9) = 0$

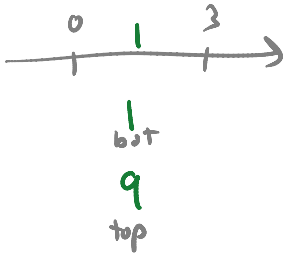
$x(x+3)(x-3) = 0$

$x = 0$ ~~$x = -3$~~ $x = 3$

We want $x \geq 0$



Which curve on top/bot?



$$\text{Area} = \int_0^3 (9x - x^3)\,dx$$

$$= \left(\frac{9}{2}x^2 - \frac{x^4}{4}\right)\Big|_0^3$$

$$= \frac{9}{2}(3)^2 - \frac{(3)^4}{4} - \left(\frac{9}{2}(0)^2 - \frac{(0)^4}{4}\right)$$

$$= \frac{81}{2} - \frac{81}{4}$$

$$= \boxed{\frac{81}{4}}$$

$(= 20.25)$

Q: When can you add two to eleven and get one as the correct answer?