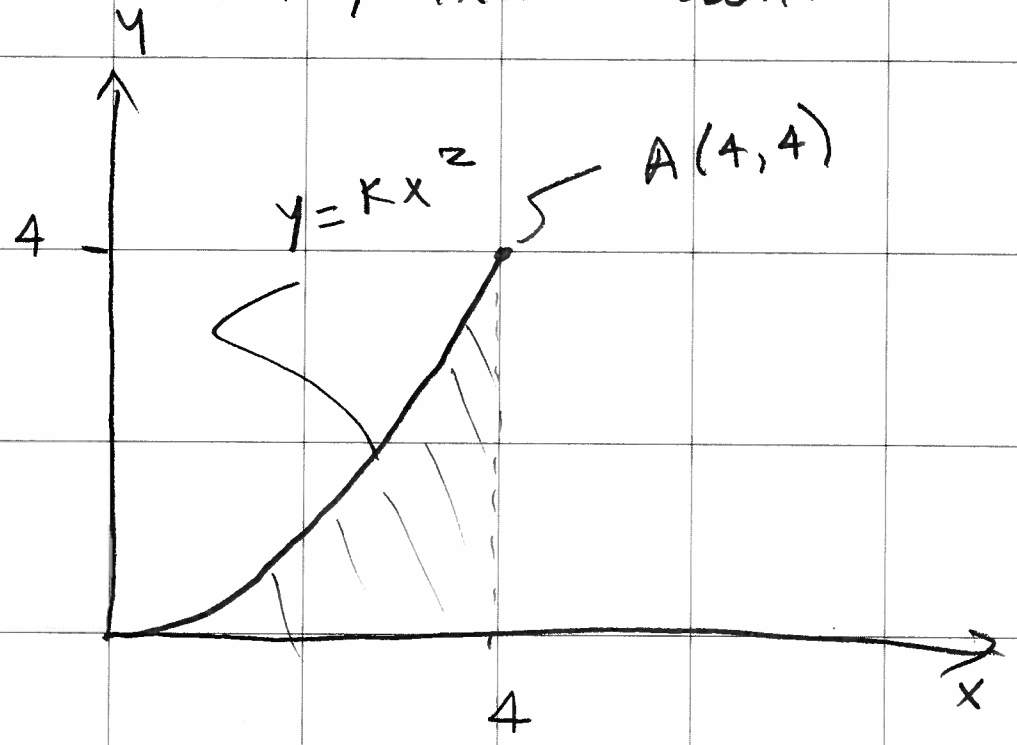
Determine the area moments of inertia about the x and y axes shown.



First determine the value of k knowing that the curve goes through point A (4,4).

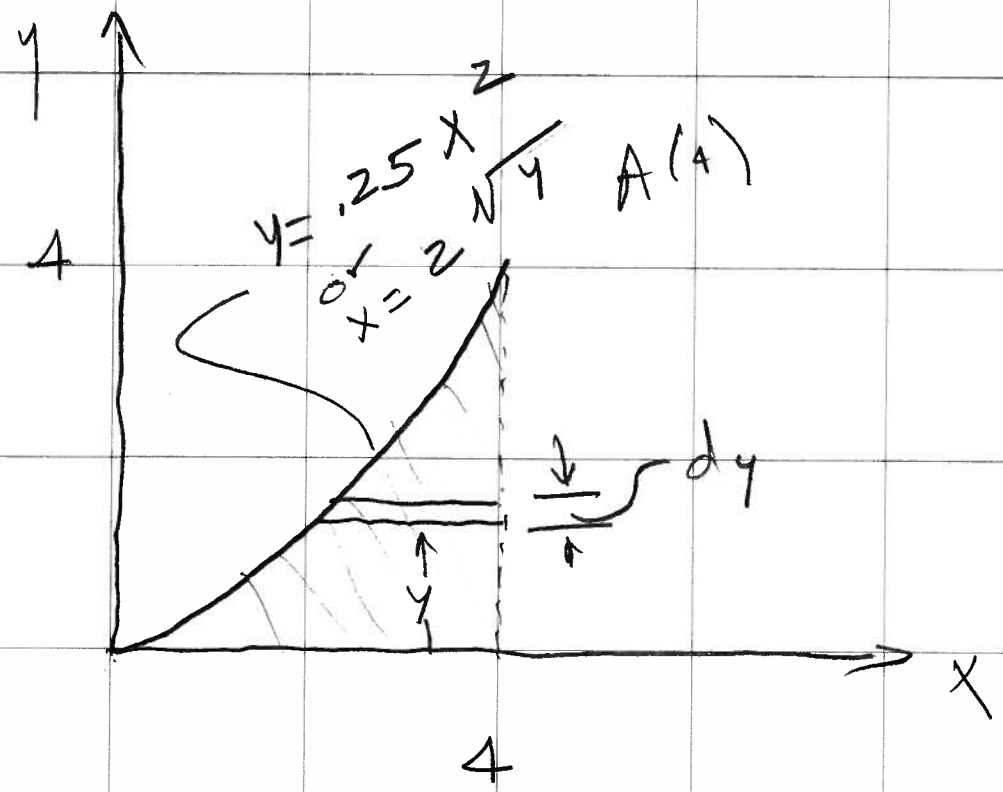
(1) $y = k x^2$

(2) $4 = k (4)^2$

(3) $k = \frac{1}{4} = .25$

(4) $y = .25 x^2$

To calculate the moment of inertia about the x-axis, choose a differential element that is parallel to the x-axis as shown



(5) $dA = (4 - x)\,dy$

(6) $dA = (4 - 2\sqrt{y})\,dy$

By definition

(7) $I_x = \int y^2 dA$

So

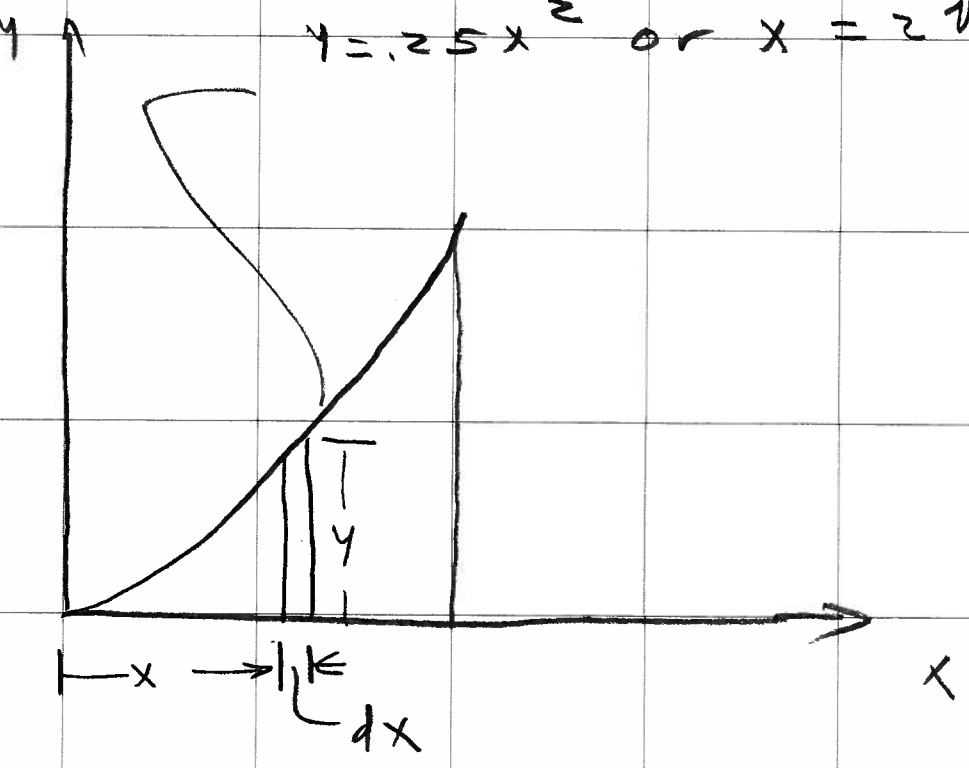
(8) $$I_x = \int_0^4 y^2 \left(4 - 2\sqrt{y}\right) dy$$

$\int(y\uparrow 2 * (4 - 2 * \sqrt{\ }(y)), y, 0, 4)$ TI-89

(9) $I_x = 12.19$ (in^4, mm^4, etc^4)

To calculate the moment of inertia about the y-axis, chose a differential element that is parallel to the y-axis as shown.

$y = .25x^2$ or $x = 2\sqrt{y}$



In this case

(10) $dA = y\,dx$

(11) $dA = .25x^2\,dx$

By definition

(12) $I_y = \int x^2\,dA$

So

(13) $I_y = \int_0^4 x^2(.25x^2)\,dx$

(14) $I_y = \int_0^4 .25x^4\,dx$

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∫(.25*X^4, X, 0, 4)
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TI-89

(15) $I_y = 51.2$ (in^4, mm^4, etc^4)