



5. [10] Let  $R$  be the region bounded by  $y = x^2$  and  $y = x + 2$ .

(a) Express the area of  $R$  as one or more integrals with respect to  $x$ . DO NOT EVALUATE THE INTEGRALS.

$$\int_{-1}^2 [(x+2) - x^2] dx$$

$$6.2.27, \frac{29}{2}$$

(b) Express the area of  $R$  as one or more integrals with respect to  $y$ . DO NOT EVALUATE THE INTEGRALS.

$$\int_0^1 (\sqrt{y} - -\sqrt{y}) dy + \int_1^4 (\sqrt{y} - (y-2)) dy$$

$x = \sqrt{y}$

[7] Let  $R$  be the region inside the circle  $x^2 + (y + 1)^2 = 4$  in the first quadrant ( $x \geq 0$  and  $y \geq 0$ ). Revolve  $R$  around the  $y$ -axis to form a solid.

(a) Find the volume of the solid of revolution expressed as one integral with respect to  $x$ . DO NOT EVALUATE THE INTEGRALS.



$$\int_0^{\sqrt{3}} 2\pi x [-1 + \sqrt{4-x^2}] dx$$

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(b) Find the volume of the solid of revolution expressed as one integral with respect to  $y$ . DO NOT EVALUATE THE INTEGRALS.



$$\int_0^1 \pi [4 - (y+1)^2] dy$$

