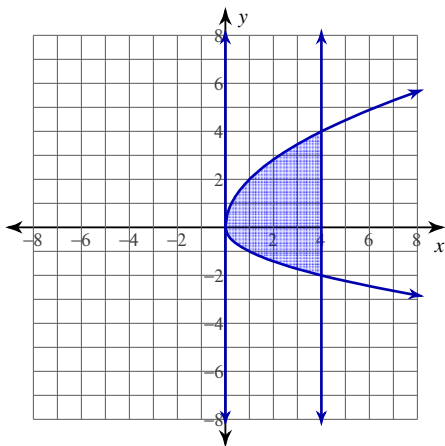


# Area Between Curves Practice

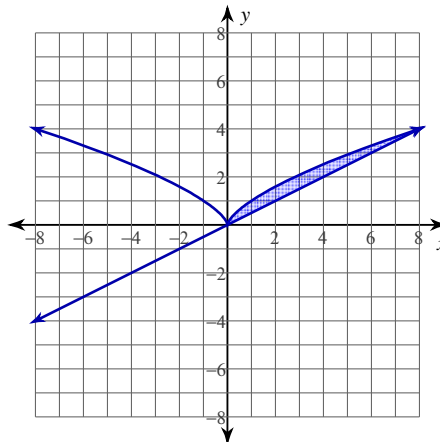
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**For each problem, find the area of the region enclosed by the curves.**

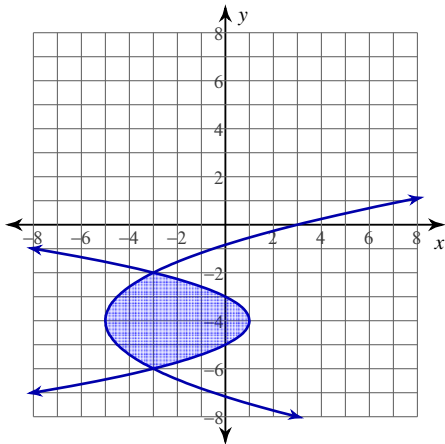
1)  $y = -\sqrt{x}$   
 $y = 2\sqrt{x}$   
 $x = 0$   
 $x = 4$



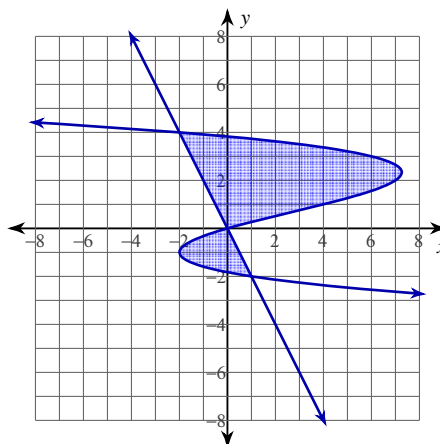
2)  $y = \sqrt[3]{x^2}$   
 $y = \frac{1}{2}x$



3)  $x = -y^2 - 8y - 15$   
 $x = \frac{y^2}{2} + 4y + 3$



4)  $x = -\frac{y^3}{2} + y^2 + \frac{7y}{2}$   
 $x = -\frac{y}{2}$



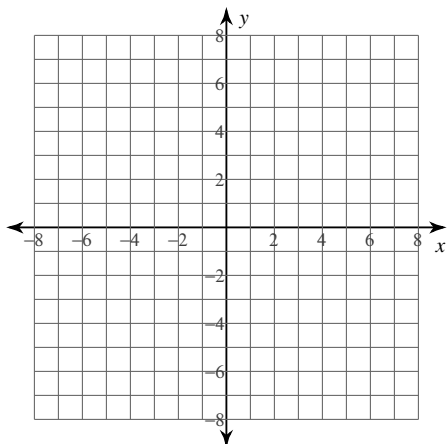
For each problem, find the area of the region enclosed by the curves. You may use the provided graph to sketch the curves and shade the enclosed region.

5)  $y = \frac{x^2}{2} - 2x$

$y = -\frac{x}{2} + 2$

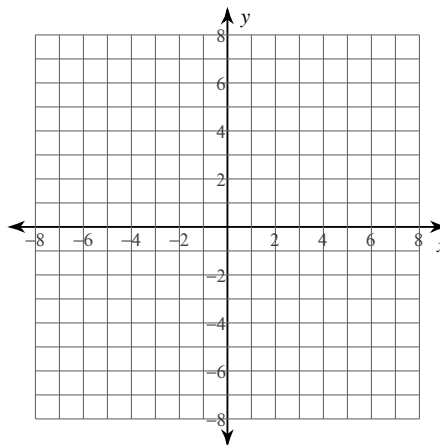
$x = 2$

$x = 6$



6)  $y = 2\sqrt{x}$

$y = \frac{x^2}{4}$

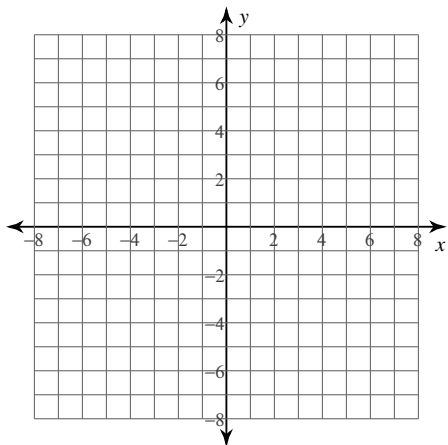


7)  $x = \frac{y^2}{2} - 6$

$x = -4$

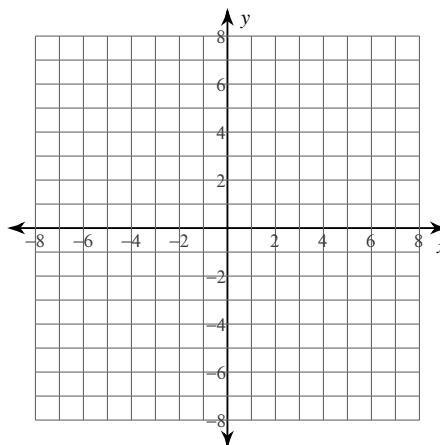
$y = -5$

$y = 0$



8)  $x = y^3 - 6y$

$x = y^2$



## Answers to Area Between Curves Practice

$$1) \int_0^4 (2\sqrt{x} + \sqrt{x}) dx$$

$$= 16$$

$$2) \int_0^8 \left( \sqrt[3]{x^2} - \frac{1}{2}x \right) dx$$

$$= \frac{16}{5} = 3.2$$

$$3) \int_{-6}^{-2} \left( -y^2 - 8y - 15 - \left( \frac{y^2}{2} + 4y + 3 \right) \right) dy$$

$$= 16$$

$$4) \int_{-2}^0 \left( -\frac{y}{2} - \left( -\frac{y^3}{2} + y^2 + \frac{7y}{2} \right) \right) dy +$$

$$\int_0^4 \left( -\frac{y^3}{2} + y^2 + \frac{7y}{2} + \frac{y}{2} \right) dy$$

$$= \frac{74}{3} \approx 24.667$$

$$5) \int_2^4 \left( -\frac{x}{2} + 2 - \left( \frac{x^2}{2} - 2x \right) \right) dx +$$

$$\int_4^6 \left( \frac{x^2}{2} - 2x - \left( -\frac{x}{2} + 2 \right) \right) dx$$

$$= 10$$

$$6) \int_0^4 \left( 2\sqrt{x} - \frac{x^2}{4} \right) dx$$

$$= \frac{16}{3} \approx 5.333$$

$$7) \int_{-5}^{-2} \left( \frac{y^2}{2} - 2 \right) dy +$$

$$\int_{-2}^0 \left( -4 - \left( \frac{y^2}{2} - 6 \right) \right) dy$$

$$= \frac{97}{6} \approx 16.167$$

$$8) \int_{-2}^0 (y^3 - 6y - y^2) dy +$$

$$\int_0^3 (y^2 - (y^3 - 6y)) dy$$

$$= \frac{253}{12} \approx 21.083$$