Kuta Software - Infinite Calculus

Name_____

Area Between Curves

Date_____ Period____

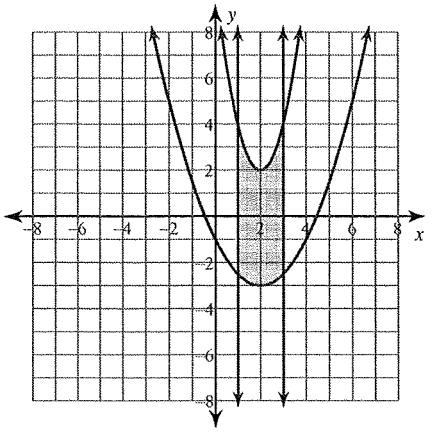
For each problem, find the area of the region enclosed by the curves.

1) $y = 2x^2 - 8x + 10$

$y = \frac{x^2}{2} - 2x - 1$

$x = 1$

$x = 3$



$$\int_1^3 \left(2x^2 - 8x + 10 - \left(\frac{x^2}{2} - 2x - 1\right)\right) dx$$

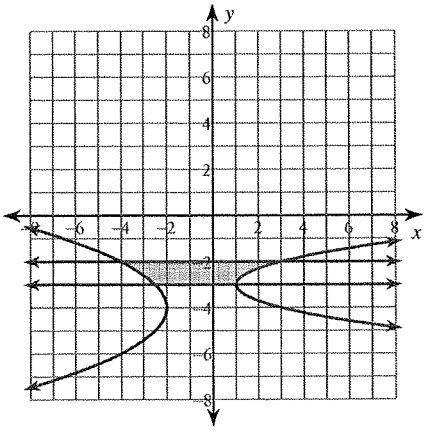
$= 11$

2) $x = 2y^2 + 12y + 19$

$x = -\frac{y^2}{2} - 4y - 10$

$y = -3$

$y = -2$

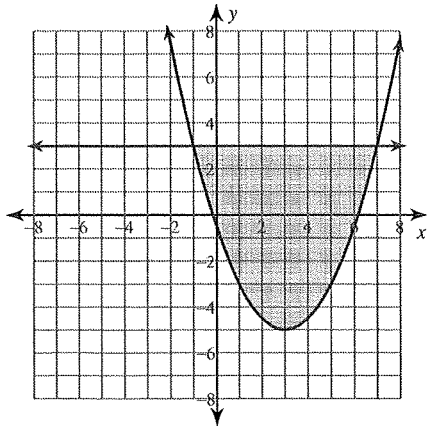


$$\int_{-3}^{-2} \left(2y^2 + 12y + 19 - \left(-\frac{y^2}{2} - 4y - 10\right)\right) dy$$

$= \frac{29}{6} \approx 4.833$

3) $y = \frac{x^2}{2} - 3x - \frac{1}{2}$

$y = 3$

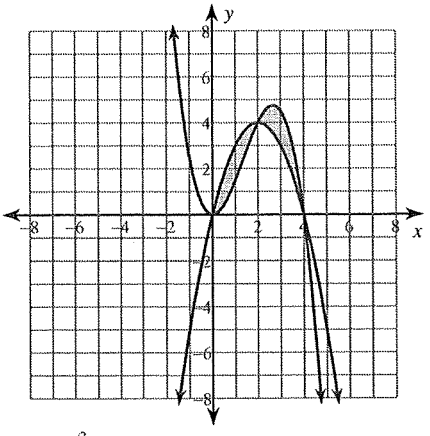


$$\int_{-1}^{7} \left(3 - \left(\frac{x^2}{2} - 3x - \frac{1}{2}\right)\right) dx$$

$= \frac{128}{3} \approx 42.667$

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

$y = -x^2 + 4x$



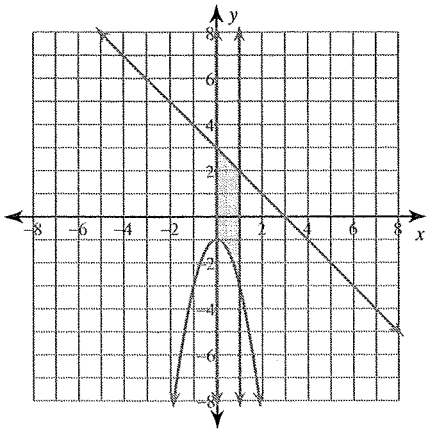
$$\int_0^2 \left(-x^2 + 4x - \left(-\frac{x^3}{2} + 2x^2\right)\right) dx +$$

$$\int_2^4 \left(-\frac{x^3}{2} + 2x^2 - \left(-x^2 + 4x\right)\right) dx$$

$= 4$

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.

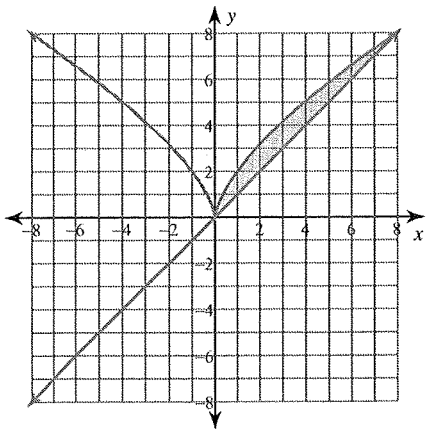
5) $y = -2x^2 - 1$
$y = -x + 3$
$x = 0$
$x = 1$



$$\int_0^1 (-x + 3 - (-2x^2 - 1))\,dx$$

$$= \frac{25}{6} \approx 4.167$$

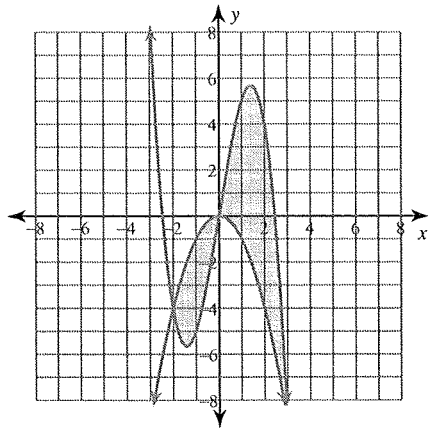
6) $y = 2\sqrt[3]{x^2}$
$y = x$



$$\int_0^8 (2\sqrt[3]{x^2} - x)\,dx$$

$$= \frac{32}{5} = 6.4$$

7) $y = -x^3 + 6x$
$y = -x^2$

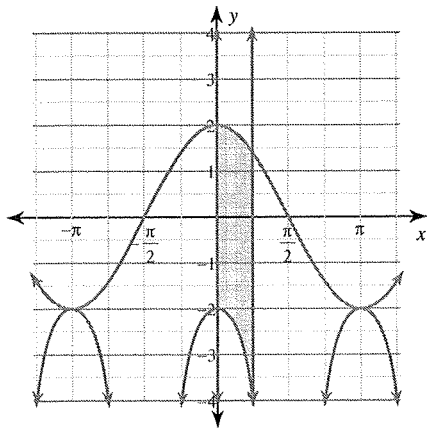


$$\int_{-2}^0 (-x^2 - (-x^3 + 6x))\,dx +$$

$$\int_0^3 (-x^3 + 6x + x^2)\,dx$$

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

8) $y = -2 \cdot \sec^2 x$
$y = 2\cos x$
$x = 0$
$x = \frac{\pi}{4}$



$$\int_0^{\frac{\pi}{4}} (2\cos x + 2 \cdot \sec^2 x)\,dx$$

$$= 2 + \sqrt{2} \approx 3.414$$