Calculus Name_____ ID: 1

Area Between two curves - along a Y-axis!

Date_____ Period____

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

1) $x = \frac{y^3}{2} + \frac{y^2}{2} - 3y,\ x = 0$

2) $x = -2y^2 - 4y + 1,\ x = 2y + 1,$
$y = -3,\ y = 1$

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

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

5) $x = -y^2 - 4y + 2,\ x = -\frac{y^2}{2} - 3y + \frac{1}{2},$
$y = -5,\ y = 0$

6) $x = y^2 - 4y - 2,\ x = \frac{y^2}{2} - 2,$
$y = -1,\ y = 4$

7) $x = -\frac{y^2}{2} + 2y - 4,\ x = \frac{y}{2} - 4,$
$y = 0,\ y = 5$

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

9) $x = y^2 - 4y,\ x = y,$
$y = -1,\ y = 3$

10) $x = y^2 - 6y + 10,\ x = 2y^2 - 8y + 7,$
$y = 1,\ y = 4$

Answers to Area Between two curves - along a Y-axis! (ID: 1)

1) $\int_{-3}^{0}\left(\frac{y^3}{2}+\frac{y^2}{2}-3y\right)dy+$
$\int_{0}^{2}\left(0-\left(\frac{y^3}{2}+\frac{y^2}{2}-3y\right)\right)dy$
$=\frac{253}{24}\approx 10.542$

2) $\int_{-3}^{0}\left(-2y^2-4y+1-(2y+1)\right)dy+$
$\int_{0}^{1}\left(2y+1-(-2y^2-4y+1)\right)dy$
$=\frac{38}{3}\approx 12.667$

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

4) $\int_{-2}^{0}\left(\frac{y^3}{2}-y^2-\frac{7y}{2}-\frac{y}{2}\right)dy+$
$\int_{0}^{4}\left(\frac{y}{2}-\left(\frac{y^3}{2}-y^2-\frac{7y}{2}\right)\right)dy$
$=\frac{74}{3}\approx 24.667$

5) $\int_{-5}^{-3}\left(-\frac{y^2}{2}-3y+\frac{1}{2}-(-y^2-4y+2)\right)dy+$
$\int_{-3}^{0}\left(-y^2-4y+2-\left(-\frac{y^2}{2}-3y+\frac{1}{2}\right)\right)dy$
$=\frac{59}{6}\approx 9.833$

6) $\int_{-1}^{0}\left(y^2-4y-2-\left(\frac{y^2}{2}-2\right)\right)dy+$
$\int_{0}^{4}\left(\frac{y^2}{2}-2-(y^2-4y-2)\right)dy$
$=\frac{47}{2}=23.5$

7) $\int_{0}^{3}\left(-\frac{y^2}{2}+2y-4-\left(\frac{y}{2}-4\right)\right)dy+$
$\int_{3}^{5}\left(\frac{y}{2}-4-\left(-\frac{y^2}{2}+2y-4\right)\right)dy$
$=\frac{79}{12}\approx 6.583$

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

9) $\int_{-1}^{0}(y^2-5y)\,dy+$
$\int_{0}^{3}(y-(y^2-4y))\,dy$
$=\frac{49}{3}\approx 16.333$

10) $\int_{1}^{3}(y^2-6y+10-(2y^2-8y+7))\,dy+$
$\int_{3}^{4}(2y^2-8y+7-(y^2-6y+10))\,dy$
$=\frac{23}{3}\approx 7.667$