

Math
2472

Test FE TH

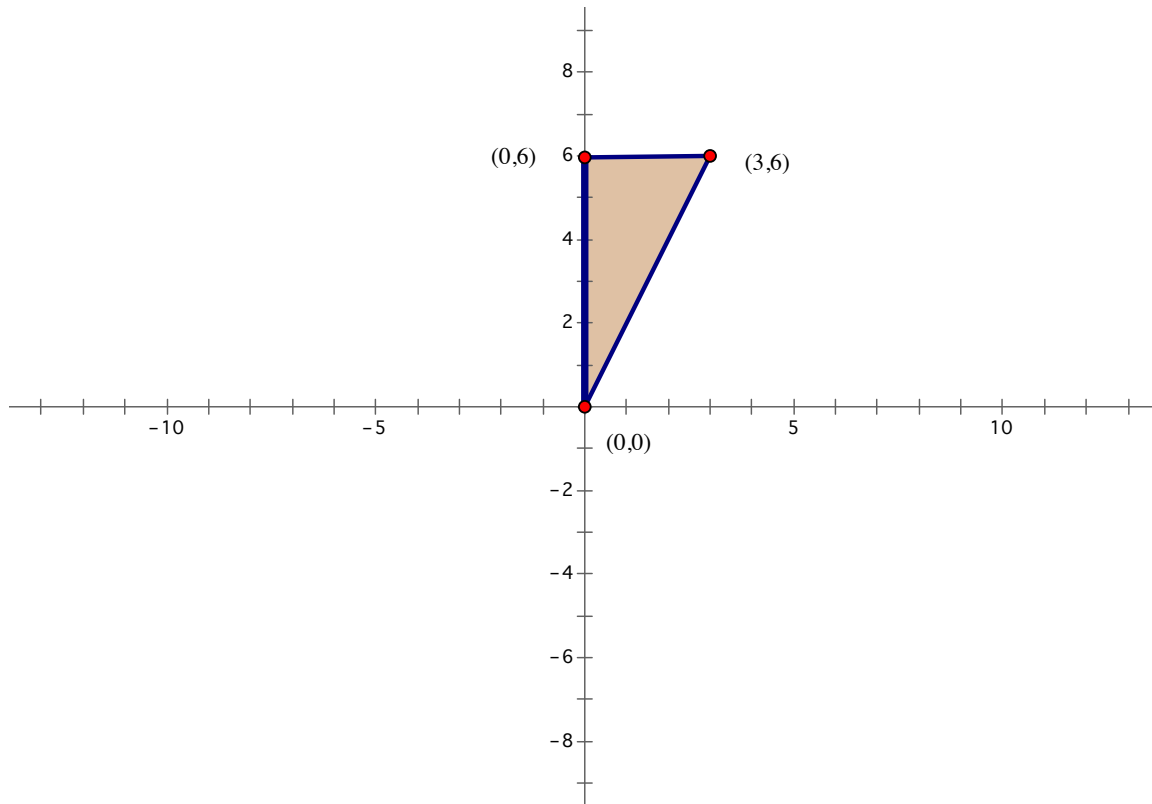
Name _____

Please sign the following agreement and hand this page in with the rest of your exam.

I, (print your name) _____, have completed this exam without the assistance or advice of any other person. I also did not assist any other student in this class with their own exam. I take academic integrity seriously and I know that if I violate this agreement I will receive an F in this course. I agree to this agreement for all take home tests that will be given.

(sign here) _____.

1. Use this region for problem 1. Make sure you use the correct technique.



1. Use the method of disks or washers to find the volume of revolution.

Revolve the region about the line $x=-2$.

2. A chain is lying on the ground. It is 20 m long and its mass is 50 kg. How much work is required to raise one end of the chain to a height of 8 m?

3. $\int \sin^2 \vartheta \cos^3 \vartheta \, d\vartheta$

4. $\int e^{2x} \sin 3x \, dx$

5. $\int \frac{1}{x^2 \sqrt{x^2 + 4}} dx$

6. A uniform density plate is outlined by two curves. The two curves are $y = x^2 - 6$ and $y = x$. Find the coordinates of the centroid for this plate. (10 points)

7. Find power series for the function $f(x) = \ln(1+x)$ and its radius of convergence. Note that

$$f'(x) = \frac{1}{1+x}.$$

8. Find the Maclaurin series for the function f and its radius of convergence.

$$f(x) = \sin(x)$$

9. Find the Taylor series for the function f at

$$a = \frac{\pi}{2} \quad f(x) = \cos(x)$$

$$x(t) = \sin(t)$$

10. Find the length of the curve for the values of the parameter t : $y(t) = \cos(t)$

$$0 \leq t \leq \frac{3\pi}{2}$$

11. Find the length of the polar curve for $0 \leq \vartheta \leq \frac{3\pi}{2}$. $r(\vartheta) = 8\cos(\vartheta)$

12. Determine the convergence or divergence and give your reason.

$$\sum_{n=1}^{\infty} \left(\frac{\pi}{6}\right)^n$$

13. Determine the convergence or divergence and give your reason.

$$\sum_{n=1}^{\infty} ne^{-n^2}$$