

## Review Test 2

1. The region bounded by  $y = x^3$  and  $y = 2x - x^2$  in the first quadrant is rotated  
(a) around the  $x$ -axis. Find Volume

(b) around the  $y$ -axis. Find Volume

2. Find volume of solid if the region bounded by  $y = x^2 + 1$  and  $y = 9 - x^2$  is rotated around  $y = -1$

3. Find Volume of region bounded by  $y=x^3$ ,  $y=0$ ,  $x=1$  rotated around  $x=2$

4. Find Volume of region bounded by  $y=\sin x$ ,  $y=\cos x$ ,  $0 \leq x \leq \pi/4$  around  $y=-1$

5. Find volume of region bounded by  $x=y^2$ ,  $x=1-y^2$  around  $x=3$

6. Find area of surface obtained if  $y = \sqrt{1+4x}$ ,  $1 \leq x \leq 5$  rotated around  $x$ -axis

7. Find area :  $y = \frac{x^3}{6} + \frac{1}{2x}$ ,  $\frac{1}{2} \leq x \leq 1$  around  $x$ -axis

8. Find area:  $x = 1+2y^2$ ,  $1 \leq y \leq 2$ , around  $x$ -axis

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9. Find surface area ;  $x = \sqrt{a^2 - y^2}$ ,  $0 \leq y \leq \frac{a}{2}$   
around  $y$ -axis

10. Find surface area :  $y = \sqrt{1+x}$ ,  $0 \leq x \leq 1$   
around  $x$ -axis

11. Find arc length ;  $y = \frac{x^3}{3} + \frac{1}{4x}$ ,  $1 \leq x \leq 2$

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12. Find arc length:  $y = \ln|\cos x|$ ,  $0 \leq x \leq \frac{\pi}{3}$

13. Find arc length:  $y = \ln(\sec x)$ ,  $0 \leq x \leq \frac{\pi}{4}$

14. Find arc length:  $y = \ln(1-x^2)$ ,  $0 \leq x \leq \frac{1}{2}$

15. Find arc length:  $y = \sqrt{x^2 + \arctan(x)}$   
 $1 \leq x \leq 2$   
 $y = \frac{1}{4}x^2 - \frac{1}{2}\ln x$

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Determine if sequences converge or not

16.  $a_n = \frac{5^{n+3}}{7^{n-1}}$

17.  $a_n = n \sin\left(\frac{1}{n}\right)$

18.  $a_n = \sqrt{\frac{5n+2}{3n+4}}$

19.  $a_n = \frac{\sin^2 n}{3^n}$

20.  $a_n = \ln(n+1) - \ln(n)$

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Determine if series conv. or not

$$21. \sum_{n=1}^{\infty} \frac{(-5)^{n-1}}{7^n}$$

$$22. \sum_{n=0}^{\infty} \frac{1}{(\sqrt{5})^n}$$

$$23. \sum_{n=1}^{\infty} e_n \left( \frac{n+1}{3n+1} \right)$$

$$24. \sum_{n=1}^{\infty} \cos(1)^n$$

$$25. \sum_{n=2}^{\infty} \frac{1}{n^3 - n}$$

$$26. \sum_{n=1}^{\infty} \frac{n}{n^2 + 1}$$

$$27. \sum_{n=2}^{\infty} \frac{1}{n \ln n}$$

$$28. \sum_{n=1}^{\infty} \frac{n^2}{n^3 + 1}$$

$$29. \sum_{n=1}^{\infty} n^2 e^{-n^3}$$

$$30. \sum_{n=1}^{\infty} \frac{1}{5n+1}$$