

Spring 2017 Math 2B Final Samples Solution

1 Final Sample 1

(1) (a) 12.

(b) 39.

(c) 4.

2) (a) $2x^7 \tan(x^2) - \sin^3 x \tan(\sin x) \cos x$.

(b) Number of barrels consumed from 2000 to 2013. The units is barrels.

3) $\frac{x^3}{3} \tan^{-1} x - \frac{1}{6}(x^2 - \ln(1 + x^2)) + C$.

4) $\ln |\ln(3x)| + C$.

5) $-\frac{\cos^3 x}{3} + \frac{2 \cos^5 x}{5} - \frac{\cos^7 x}{7} + C$.

6) $\sqrt{x^2 - 25} - 5 \cos^{-1}\left(\frac{5}{x}\right) + C$.

7) (a) Divergent.

(b) Convergent. π

8) (a) $\frac{4}{\pi}$.

(b) $\frac{2}{27}(10^{3/2} - 1)$.

9) $1 + 2x + 3x^2 + 4x^3$. $R = 1$.

10) (a) Convergent. 3.

(b) Convergent. 0.

(c) Convergent. $\frac{\pi}{2}$.

11) 8.

12) (a) $\frac{108}{5}\pi$.

(b) $\frac{81}{10}$.

- 13) (a) True. $f \geq 0$ so the integral is the area under the curve.
 (b) True. Taylor series of \cos evaluated at π .
 (c) False. The derivative of a number is 0.
 (d) True. The harmonic series is divergent.
- 14) (a) Convergent. Comparison test.
 (b) Convergent. Alternating series test.
 (c) Convergent. Ratio test.
 (d) Convergent. Integral test.
 (e) Convergent. Limit Comparison Test.

2 Final Sample 2

- 1) (a) 10.
 (b) 19.
 (c) 9.
 (d) Height of the rocket after 4 minutes.

(2) $\frac{1}{2} \arctan x^2 + C.$

(3) $-\frac{1}{2}e^{-2x}(x^2 + x + \frac{1}{2}) + C.$

(4) $-\frac{1}{4}(\cos(4t) - \frac{\cos^3(4t)}{3}) + C.$

5) $\frac{1}{9} \frac{\sqrt{x^2 - 9}}{x} + C.$

6) $\ln 2.$

7) $\frac{5}{3}.$

8) $\frac{8}{3}\pi.$

9) (a) Divergent. $+\infty.$

(b) Convergent. 0.

c) Convergent. $\frac{\pi}{2}.$

10) $\ln(1 + \sqrt{2}).$

11) (a) Divergent.

(b) Convergent.

(c) Convergent.

(d) Divergent.

12) (a) $\frac{3}{10}$.

(b) $\frac{11}{18}$.

13) $\frac{2}{3} \sum_{k=0}^{+\infty} \left(\frac{x}{3}\right)^k. I = (-3, 3).$