

Solutions to Week in Review 5

1. a.) Diverges

b.) Converges to $\frac{1}{3}$

c.) Converges to -1

d.) Converges to $\frac{\pi}{3}$

e.) Diverges

f.) Converges to $\frac{75}{4}$

2. a.) Converges by comparison to $\int_0^{\infty} \frac{1}{e^{5x}} dx$

b.) Diverges by comparison to $\int_2^{\infty} \frac{1}{x^{1/2}} dx$

c.) Converges by comparison to $\int_1^{\infty} \frac{1}{x^4} dx$

d.) Converges by comparison to $\int_1^{\infty} \frac{\pi/2 + 5}{x^2} dx$

3. $p > 1$

4. $y = \sqrt[3]{\frac{1}{2}x^2 - \frac{1}{3}e^{3x} + C}$

5. $y = e^{\pm\sqrt{1/2x^2+2C}}$

6. $y = \ln\left(\frac{1}{3}e^{3x} + e^2 - \frac{1}{3}\right)$

7. $y = \tan(x - x^2)$

8. $5e^{-0.4}$ kg of salt.

9. $y = \frac{1}{3}x - \frac{1}{9} + Ce^{-3x}$

10. $y = x(\ln \frac{x^2}{64} + \frac{1}{4})$

11. $y = \frac{-1/2 \cos(x^2) + \pi - 1/2}{x^2}$

12. $y = 100 - 100e^{-.005t}$ kg of salt