

Answers

Autumn 2007 Math 125 Final

1. a. $\ln|x-1| - \frac{1}{2}\ln|x^2+4| - 2\arctan\left(\frac{x}{2}\right) + C$

b. $\frac{1}{\sqrt{3}}\arctan\left(\frac{\sin x - 2}{\sqrt{3}}\right) + C$

2. 3

3. $y(x) = \tan\left(\frac{x^3}{3} + \frac{\pi}{4}\right)$

4. $-\frac{4}{9}$

5. $\frac{1}{3}(x^2-9)^{3/2} + 9\sqrt{x^2-9} + C$

6. converges to the value $\frac{9}{8}$

7. a. $\frac{2400}{\pi} - 600 \approx 163.94$ ft

b. average velocity of A: 40 ft/sec

average velocity of B: $\frac{160}{\pi} \approx 50.93$ ft/sec

8. b. $12\pi^2$

9. $\frac{77175\pi}{8} \approx 30306.5$ Joules

10. a. 2

b. $\bar{x} = 1$, $\bar{y} = \frac{\pi}{4}$

c. $\pi^2 + 4\pi$

11. a. $\frac{dP}{dt} = (.02)P + 1000$

b. $P(t) = 75,000e^{(.02)t} - 50,000$

c. 2014