

**Math 2315 - Calculus II**  
**Quiz #6 - 2010.03.01**  
**Solutions**

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1. Determine whether the sequence converges or diverges:

$$a_n = \ln(3n + 4) - \ln(4n - 3)$$

Notice that

$$\ln(3n + 4) - \ln(4n - 3) = \ln\left(\frac{3n + 4}{4n - 3}\right),$$

thus

$$\begin{aligned}\lim_{n \rightarrow \infty} a_n &= \lim_{n \rightarrow \infty} \ln(3n + 4) - \ln(4n - 3) \\ &= \lim_{n \rightarrow \infty} \ln\left(\frac{3n + 4}{4n - 3}\right) \\ &= \ln\left(\lim_{n \rightarrow \infty} \frac{3n + 4}{4n - 3}\right) \\ &= \ln\left(\frac{3}{4}\right).\end{aligned}$$