Homework Set 11

Basic Limits

(sect 1.4, 1.6, 3.1 – 3.2)

Use an appropriate rule to compute the following limits.

1. $\lim_{x\to\infty} \frac{1}{x^{5/2}}$ $= 0$

2. $\lim_{x\to\infty} \left(\frac{1}{3}\right)^x$ $= 0$

3. $\lim_{x\to 0} \frac{x}{\sin x}$ $= 1$

4. $\lim_{x\to-\infty} \arctan x$ $= -\pi/2$

5. $\lim_{x\to\infty} \ln(x^3)$ $= \infty$

6. $\lim_{x\to\infty} e^{-2x}$ $= 0$

7. $\lim_{x\to 7} 53$ $= 53$

8. $\lim_{x\to 1} \ln x$ $= 0$

9. $\lim_{x\to\infty} \left(\frac{9}{10}\right)^{-x}$ $= \infty$

10. $\lim_{x\to 0} \frac{\tan 2x}{3x} = \lim_{x\to 0} \frac{\sin 2x}{3x\cos 2x} = \lim_{x\to 0} \left(\frac{\sin 2x}{2x} \cdot \frac{2}{3\cos 2x}\right)$

$= 1 \cdot \lim_{x\to 0} \frac{2}{3\cos 2x} = \frac{2}{3\cos 0} = 2/3$