Calculus
Mixed Practice #1

Name:
Date: Period:

Evaluate the limit using l'Hopital's Rule if necessary.

1. $\lim_{x\to 0}\dfrac{x-\sin x}{\tan x}$

2. $\lim_{x\to 0^+} x^{\sin 3x}$

3. $\lim_{x\to 0}\left(\dfrac{1}{x}-\dfrac{1}{x^2}\right)$

Use limits to determine which function grows faster.

4. $\sqrt{x^2+x}$ *and* x

5. $\ln x$ *and* $x-1$

6. x^3 *and* $\ln(\ln x)$

Evaluate the integral.

7. $\int_0^1 \sqrt[5]{1-2x}\,dx$

8. $\int_0^{\frac{\pi}{2}} \sin^4 x\cos x\,dx$

9. $\int \dfrac{x-2}{x-1}dx$

10. $\int_3^{\infty} \dfrac{1}{x}dx$

11. $\int_0^{\infty} \dfrac{x}{\left(4+x^2\right)}dx$

12. $\int_0^4 \dfrac{\ln\sqrt{x}}{\sqrt{x}}dx$