FORMS

TEXT: 1.5

LAST NAME	FIRST NAME	DATE

1 (4 points)**.** Find a specific example for the form

(a) $L \cdot \infty$

(c) $\dfrac{L}{0^+}$

(b) $\infty^{-\infty}$

(d) 0^0

2 (3 points)**.** Find a specific example for the form $\infty - \infty$ which

(a) converges to 0

(b) converges to a non-zero limit

(c) diverges to ∞

3. Do the same as the above for the form $\infty \cdot 0$

4 (2 points). Find the limit or show it does not exist.

$$\lim_{x\to\infty} \frac{(2x^2+1)^2}{(x-1)^2(x^2+x)} =$$

5 (2 points). Find the limit or show it does not exist.

$$\lim_{x\to-\infty} \frac{\sqrt{1+4x^6}}{2-x^3} =$$

6 (2 points). Find the limit or show it does not exist.

$$\lim_{x\to0^+} \frac{10x^3-3x\sqrt{x}}{(x-7\sqrt{x})^2} =$$

Indeterminate Forms

$\infty - \infty$	$\infty + (-\infty)$	$0 \cdot (\pm\infty)$	$\dfrac{0}{0}$
$\dfrac{\pm\infty}{\pm\infty}$	$(\pm\infty)^0$	$1^{\pm\infty}$	0^0

Forms with Limits

L is any finite limit, B is anything bounded

$\infty + \infty = \infty$	$-\infty - \infty = -\infty$	$B \cdot 0 = 0$
$\dfrac{B}{\pm\infty} = 0$	$\dfrac{\pm\infty}{\lvert B\rvert} = \pm\infty$	$\dfrac{\pm\infty}{-\lvert B\rvert} = \mp\infty$
$\infty \cdot \infty = \infty$	$\infty \cdot (-\infty) = -\infty$	$(-\infty)(-\infty) = \infty$
$0^{\infty} = 0$	$\infty^{\infty} = \infty$	$\infty^{-\infty} = 0$
if $L > 0$, then :	$L \cdot \infty = \infty$	$L \cdot (-\infty) = -\infty$
	$\dfrac{L}{0^+} = \infty$	$\dfrac{L}{0^-} = -\infty$
if $L < 0$, then :	$L \cdot \infty = -\infty$	$L \cdot (-\infty) = \infty$
	$\dfrac{L}{0^+} = -\infty$	$\dfrac{L}{0^-} = \infty$
if $L > 1$, then :	$L^{\infty} = \infty$	$L^{-\infty} = 0$
if $0 < L < 1$, then :	$L^{\infty} = 0$	$L^{-\infty} = \infty$

Detach this page and keep it as a formula sheet.
You will not be able to use it on any test though.