4. Fill in the blanks to complete each statement.

(basic skills in #23–68 in 5.2, #17-44 in 5.3, #23–62 in 6.3, and #45-66 in 6.4)

3 pts each

↓

30 pts

$$\lim_{x \to \frac{\pi}{2}^-} \sec x = \underline{\infty}$$

$$\frac{d}{dx}(\sec^2 x) = \underline{2\sec x \cdot \sec x \tan x}$$

$$\lim_{h \to 0}(1+h)^{\frac{1}{h}} = \underline{e}$$

$$\frac{d}{dx}(\ln|x|) = \underline{\frac{1}{x}}$$

$$\lim_{x \to 0^+} \csc 3x = \underline{\infty}$$

$$\frac{d}{dx}(2^{3x+1}) = \underline{(\ln 2)2^{3x+1}(3)}$$

$$\lim_{x \to 0} \tan^{-1} x = \underline{0}$$

$$\frac{d}{dx}(\sin^{-1}(x^3)) = \underline{\frac{1}{\sqrt{1-(x^3)^2}}(3x^2)}$$

$$\lim_{x \to 0} \frac{2}{4 + e^{-2x}} = \underline{\frac{2}{5}}$$

$$\frac{d}{dx}(\ln(x^5 + 1)) = \underline{\frac{1}{x^5+1}(5x^4)}$$

5. Circle ALL of the following that are equal to $\dfrac{\tan^{-1} x}{\sin^{-1} x}$, and cross out the rest.

(similar skills as #51 in 6.4)

8 pts

A) $\dfrac{\cot x}{\csc x}$ ✗

B) $\left(\dfrac{\tan x}{\sin x}\right)^{-1}$ ✗

C) $\dfrac{\sin x}{\tan x}$ ✗

D) $\dfrac{\arctan x}{\arcsin x}$ ⊙

6. Circle ALL of the following that FAIL to be in the domain of $f(x) = \dfrac{1}{\sqrt{\ln(x-2)}}$, and cross out the rest.

(similar to #43 in 5.1)

8 pts

A) $x = 0$ ⊙

B) $x = 1$ ⊙

C) $x = 2$ ⊙

D) $x = 3$ ⊙

7. Circle ALL of the following that are valid trigonometric identities, and cross out the rest.

(similar to #5–8, #9–12, and #44-49 in 6.2)

8 pts

A) $\csc(-\theta) = -\csc(\theta)$ ⊙

C) $\sin\theta\cos\theta = 1 + \cos\theta$ ✗

B) $2\sin^2\theta - \cos 2\theta = 1$ ✗

D) $1 - \cos^2\theta = \sin^2\theta$ ⊙

8. Circle the ONE answer that is equal to $\lim_{x \to \frac{\pi}{2}} \dfrac{\sin(\cos x)}{\cos x}$, and cross out the rest.

(similar to #15 in chapter 6 review)

8 pts

A) -1

B) 1 ⊙

C) ∞

D) 0

+2 free

62 + 2 = 64

232 TEST 1

You may use your notebook during the last fifteen minutes of this exam.
You may NOT use calculators, cell phones, loose papers, or peeking.

Math 232
February 10, 2012.   Name: _____ ✳ key ✳   V2 _____
By printing my name I pledge to uphold the honor code.

1. Determine whether each of the following is True (T) or False (F).
   (similar to #1 in 5.1-5.5 and 6.1-6.4)

   (T) F   If $\lim\limits_{h \to 0} \frac{b^h - 1}{h} = 1$, then $b = e$.

   (T) F   If $\lim\limits_{x \to 2} \ln(f(x)) = 0$, then $\lim\limits_{x \to 2} f(x) = 1$.

   T **(F)**   If $\sin^{-1} x = \theta$ then $\sin \theta$ is greater than or equal to zero.

   (T) F   If $Q(t)$ is exponential with continuous growth rate k, then $Q'(t) = kQ(t)$.

   T **(F)** $3(2^x)$ is equal to 6^x.

   T **(F)** $\ln x = \frac{1}{x}$.

   T **(F)**   To find the derivative of $\tan x$ we had to use the definition of derivative.

   (T) F   The graph of $\csc x$ has vertical asymptotes at $x = k\pi$, for any integer k.

   T **(F)**   There are only two angles whose sine is $-\frac{1}{4}$.

   (T) F $f(x) = 50 - 2^x$ has a horizontal asymptote at $y = 50$.

   2 each
   ↓
   20 pts

2. Circle the ONE answer that is equal to $\lim\limits_{x \to \frac{\pi}{2}} \dfrac{\sin(\cos x)}{\cos x}$, and cross out the rest.
   (similar to #15 in chapter 6 review)

   2 each
   → 8 pts

   A) ∞ B) -1 C) 0 **D)** 1

3. Circle ALL of the following that FAIL to be in the domain of $f(x) = \dfrac{1}{\sqrt{\ln(x-2)}}$, and
   cross out the rest.   *(similar to #43 in 5.1)*

   8 pts

   A) $x = 2$ **B)** $x = 0$ **C)** $x = 3$ **D)** $x = 1$

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