



CALCULUS A/B

Unit 5—Skills Review

Name _____

Period: 2

Date: _____

These questions will approximate the questions you will have on the skills portion of chapter 5 Unit test

LT: I can find the derivative of a natural log function (5.1)

1) $f(x) = \ln(x^2 - 3x)$ 2) $f(x) = \ln(\cos x)$ 3) $f(x) = 4\ln(\sqrt{x^2 - 4})$ 4) $f(x) = \ln\left(\frac{2x}{x^2+4}\right)$

LT: I can find the equation of a tangent line (5.1)

Find the equation of the tangent line to the graph of f at the given point.

5) $f(x) = \ln(x^3 - 7)$; at $x=2$ 6) $f(x) = \frac{1}{2}x\ln(x^2)$; at $x=1$ 7) $f(x) = (\sin x)\ln(\cos x)$; at $x = 0$

LT: I can find the relative extrema and points of inflection (5.1)

- a) locate any relative extrema
- b) locate any point of inflection

8) $f(x) = x\ln x$ 9) $f(x) = \frac{\ln x}{x}$

LT: I can integrate a rational function (5.2)

Find the integral for each:

10) $\int \frac{x}{3x^2-4} dx$ 11) $\int \frac{-3}{\tan x \cos^2 x} dx$ 12) $\int \frac{6x^2-8x}{x^3-2x^2-6} dx$ 13) $\int \frac{(4x+6)\cos(x^2+3x)}{\sin(x^2+3x)} dx$

LT: I can integrate a rational function when denominator is not the higher power (long division or u-sub) (5.2)

Find the integral for each:

14) $\int \frac{3x^2-5x+1}{x-2} dx$

15) $\int \frac{x^2-6x-20}{x+5} dx$

16) $\int \frac{3 \sin 2x}{\cos 2x} dx$

17) $\int \sec(5x) dx$

LT: I can find the value of a definite integral of a rational function (5.2)

...keep answers in (natural log...ln) form.

18) $\int_3^6 \frac{2}{2x-5} dx$

19) $\int_1^3 \frac{3x-1}{3x^2-2x} dx$

20) $\int_{\frac{\pi}{2}}^{2\pi} \sec x \sin x dx$

21) $\int_{\frac{\pi}{15}}^{\frac{\pi}{5}} \tan(5x) dx$

LT: I can find the equation of a function given the derivative and one point through the graph (5.2)

Find the integral for each:

22) $\frac{dy}{dx} = \frac{3}{2-x}$; (1,0)

23) $\frac{dy}{dx} = \frac{x-2}{x}$; (-1,0)

24) $\frac{dy}{dx} = \frac{\sec^2 t}{\tan(t)+1}$; (π , 4)

These (#25-28) will not be assessed on the chp. Test...though they will be on the AP exam in May.

There will be one bonus question on the M.C. test on Friday covering this material.

LT: I can find the inverse of a function and I understand their graphical relationship (reflection of each other across the y=x line) and other properties...such as $f^{-1}(f(x))=x$

LT: I can find the derivative of an inverse function

if $f(x)$ is the original function, $f^{-1}(x)$ is the inverse.

the derivative of the inverse $[(f^{-1})'(x)] = \frac{1}{f'(f^{-1}(x))}$

Find the inverse function for both:

25) $y = e^{5x-2}$

26) $y = 3 + \ln(5x)$

Find the derivative of each function's inverse at x=3

27) $y = x^2 + 4x$

28) $y = e^{4x}$

LT: I can differentiate an exponential function (with base e) (5.4)

Find the derivative for each:

29) $y = e^{4x-2}$

30) $y = 6x^2 e^{4x}$

31) $y = e^{x^2} \ln 2x$

32) $y = e^{\sin 4x}$

LT: I can find the integral of an exponential function (with base e) (5.4)

33) $\int e^{3x} dx$

34) $\int x^2 e^{x^3} dx$

35) $\int e^{4x}(e^{4x} - 3) dx$

36) $\int \frac{e^{3x}}{e^{3x}+1} dx$

LT: I can find the value of a definite integral of an exponential function (with base e) (5.4)

...keep answers in terms of e

37) $\int_0^3 e^{2x} dx$

38) $\int_0^{\frac{3\pi}{4}} \cos x e^{\sin x} dx$

39) $\int_0^2 \frac{e^{2x}}{1+e^{2x}} dx$

40) $\int_1^4 e^{5x-3} dx$