KEY by Code → Last page

#59
§3.2

1. An equation of the **tangent line** to the graph of $f(x) = -2x^4 + 5x^2 - 3$ at the point $(1, 0)$ is given by

(a) $y = 2x - 2$ ____________________(correct)

(b) $y = -2x + 2$

(c) $y = \frac{1}{2}x - \frac{1}{2}$

(d) $y = 3x - 3$

(e) $y = 2x - 3$

$f'(x) = -8x^3 + 10x$

slope $= f'(1) = -8 + 10 = 2$

Eq: $y - 0 = 2(x-1)$

$\Rightarrow y = 2x - 2$

#103
§3.4

2. The **slope** of the tangent line to the graph of $f(x) = \dfrac{5}{x^3 - 2}$ at the point $\left(-2, -\frac{1}{2}\right)$ is equal to

(a) $-\frac{3}{5}$ ____________________(correct)

(b) $-\frac{5}{2}$

(c) $-\frac{3}{10}$

(d) $-\frac{15}{2}$

(e) -1

$f'(x) = \dfrac{(x^3-2)\cdot 0 - 5(3x^2)}{(x^3-2)^2} = \dfrac{-15x^2}{(x^3-2)^2}$

slope $= f'(-2) = \dfrac{-15 \cdot 4}{(-10)^2} = -\dfrac{60}{100} = -\dfrac{6}{10} = -\dfrac{3}{5}$

#84, p.116, Review of chapter 2

3. $\lim\limits_{x\to(1/2)^+} \dfrac{x}{2x-1} =$

$\frac{1}{0}$; in the limit, It goes to $\pm\infty$

But for $x > \frac{1}{2}$, $f(x) > 0$

So $\lim\limits_{x\to 1/2^+} \dfrac{x}{2x-1} = \infty$

(a) ∞ (correct)

(b) $-\infty$

(c) $\dfrac{1}{2}$

(d) 0

(e) -1

#89 §3.1

4. If $f(x) = \begin{cases} x^2+1 & x \le 2 \\ 4x-3 & x > 2, \end{cases}$ then $f'(2) =$

(a) 4 (correct)

(b) 2

(c) 1

(d) 0

(e) does not exist

Derivative from the left

$\lim\limits_{x\to 2^-} \dfrac{f(x)-f(2)}{x-2} = \lim\limits_{x\to 2^-} \dfrac{x^2+1-5}{x-2} = \lim\limits_{x\to 2^-} \dfrac{x^2-4}{x-2} = \lim\limits_{x\to 2^-} (x+2) = 4$

Derivative from the right

$\lim\limits_{x\to 2^+} \dfrac{f(x)-f(2)}{x-2} = \lim\limits_{x\to 2^+} \dfrac{4x-3-5}{x-2} = \lim\limits_{x\to 2^+} \dfrac{4x-8}{x-2} = \lim\limits_{x\to 2^+} 4 = 4$

Both are equal $\Rightarrow f'(2) = 4$.

~ #76 §2.4 ~ #47 §4.6

5. If (a, b) is the interval on which $f(x) = \dfrac{\ln(2-x)}{\sqrt{2x-3}}$ is **continuous**, then $ab =$

(a) 3 ____________________ (correct)

(b) $\dfrac{9}{2}$

(c) $\dfrac{5}{2}$

(d) 4

(e) 2

f is Continuous when

$2-x>0$ and $2x-3>0$

$\Rightarrow$ $x<2$ and $x>\frac{3}{2}$

$a=\frac{3}{2}$, $b=2$ $\Rightarrow$ $ab=3$

6. Which one of the following statements is **TRUE**?

(a) If $f(x) = \dfrac{1}{g(x)}$ and $g(c) = g'(c) = -1$, then $f'(c) = 1$. ____________________ (correct)

(b) If $y = (x+1)(x+2)(x+3)$, then $\dfrac{d^3y}{dx^3} = 0$.

(c) If $f'(x) = g'(x)$, then $f(x) = g(x)$.

(d) If $h(x) = f(x)\,g(x)$ and $f'(c) = g'(c) = 1$, then $h'(c) = 1$.

(e) If $f(x) = \pi^3$, then $f'(x) = 3\pi^2$.

(a) $f'(x) = -\dfrac{g'(x)}{[g(x)]^2} \Rightarrow f'(c) = -\dfrac{g'(c)}{[g(c)]^2} = -\dfrac{-1}{(-1)^2} = 1$

#11
§3.5

7. If y is defined implicitly as a differentiable function of x by the equation $x^3y^3 - y = x$, then $\frac{dy}{dx} =$

$x^3 \cdot 3y^2 \cdot y' + y^3 \cdot 3x^2 - y' = 1$

$y'(3x^3y^2 - 1) = 1 - 3x^2y^3$

(a) $\frac{1-3x^2y^3}{3x^3y^2-1}$ ——————————(correct)

$\Rightarrow y' = \frac{1-3x^2y^3}{3x^3y^2-1}$

(b) $\frac{3x^2y^3}{3x^3y^2-1}$

(c) $\frac{1-x^2y^3}{x^3y^2-1}$

(d) $\frac{x-y}{x^2y^2-1}$

(e) $\frac{1-3x^2y^3}{3x^3y^2}$

#71
§3.5

8. If $f(x) = \frac{x^2\sqrt{3x-2}}{(x+1)^2}$, then $f'(1) =$

$\ln y = 2\ln x + \frac{1}{2}\ln(3x-2) - 2\ln(x+1)$

(a) $\frac{5}{8}$ ——————————(correct)

$\frac{1}{y} \cdot y' = \frac{2}{x} + \frac{1}{2} \cdot \frac{3}{3x-2} - 2 \cdot \frac{1}{x+1}$

(b) $\frac{5}{4}$

(c) $\frac{5}{6}$

$x=1 \Rightarrow y = f(1) = \frac{1 \cdot 1}{4} = \frac{1}{4}$

(d) $\frac{3}{8}$

(e) $\frac{3}{4}$

$4y' = 2 + \frac{3}{2} - 1$

$4y' = 1 + \frac{3}{2} = \frac{5}{2}$

$\Rightarrow y' = \frac{5}{8}$

Example 2

§4.1

9. If $f(x) = 3x^4 - 4x^3$ has an **absolute minimum** at the point (a, b) on the interval $[-1, 2]$, then $ab =$

$\cdot\ f'(x) = 12x^3 - 12x^2 = 12x^2(x-1)$

(a) -1 (correct)

(b) 0

(c) -7

(d) 32

(e) 10

$\cdot\ f'(x) = 0 \Longrightarrow x = 0,\ x = 1 \quad \in (-1, 2)$

$\cdot\ f(0) = 0$

$f(1) = 3 - 4 = -1 \leftarrow$ min value of f at $(1, -1)$

$f(-1) = 3 + 4 = 7$

$f(2) = 3(16) - 4(8) = 16(3-2) = 16$

$a = 1,\ b = -1$

$\Rightarrow ab = -1$

$\sim$ # 84

§3.3

10. The **slope** of the tangent line to the graph of $f(x) = \dfrac{1}{x}$, $x > 0$, that passes through the point $(1, -3)$ is equal to

(a) -9 (correct)

(b) -4

(c) $-\dfrac{9}{4}$

(d) $-\dfrac{25}{4}$

(e) -25

Slope (Math002) = Slope (Math101)

$$\frac{y_0 + 3}{x_0 - 1} = -\frac{1}{x_0^2}$$

$\Rightarrow x_0^2(y_0 + 3) = -x_0 + 1$

$\Rightarrow x_0^2\left(\frac{1}{x_0} + 3\right) = -x_0 + 1$

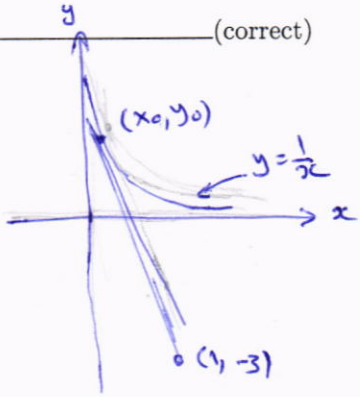
$\Rightarrow x_0 + 3x_0^2 = -x_0 + 1$

$\Rightarrow 3x_0^2 + 2x_0 - 1 = 0$

$\Rightarrow (3x_0 - 1)(x_0 + 1) = 0$

$\Rightarrow x_0 = \frac{1}{3},\ x_0 = -1$

$\Rightarrow \boxed{x_0 = \frac{1}{3}}$ as $x_0 > 0$



$x_0 > 0$

$$\text{Slope} = -\frac{1}{x_0^2} = -\frac{1}{\left(\frac{1}{9}\right)} = -9$$

$\sim \#19$

§5.9

11. If $\sinh x = -\frac{1}{2}$, then $\tanh x =$

$\cdot\ \cosh^2 x - \sinh^2 x = 1$

$\cosh^2 x - \frac{1}{4} = 1$

(a) $-\frac{\sqrt{5}}{5}$ ______ (correct)

$\cosh^2 x = 1 + \frac{1}{4} = \frac{5}{4}$

(b) $\frac{\sqrt{5}}{5}$

$\Rightarrow \cosh x = \frac{\sqrt{5}}{2}$ $\quad (\cosh x > 0 \text{ for all } x)$

(c) $-\frac{\sqrt{3}}{3}$

$\cdot\ \tanh x = \frac{\sinh x}{\cosh x}$

(d) $-\sqrt{5}$

(e) $\frac{\sqrt{5}}{2}$

$= \frac{-\frac{1}{2}}{\frac{\sqrt{5}}{2}} = -\frac{1}{\sqrt{5}} = -\frac{\sqrt{5}}{5}$

$\sim \#29$

§5.9

12. If $f(x) = \frac{1}{2}\ln(\sinh(x^2))$, then $f'(x) =$ $\frac{1}{2} \cdot \frac{1}{\sinh(x^2)} \cdot \cosh(x^2) \cdot 2x$

(a) $x\coth(x^2)$ ______ (correct)

(b) $x\tanh(x^2)$

$= x \coth(x^2)$

(c) $\frac{1}{2}x\cosh(x^2)$

(d) $\frac{1}{2}x\,\mathrm{csch}\,(x^2)$

(e) $2x\,\mathrm{sech}\,(x^2)$

#72
§5.6

13. $\lim_{x\to\infty} \frac{(\ln x)^2}{x^3} =$ $\frac{\infty}{\infty}$

$\overset{L'R}{=} \lim_{x\to\infty} \frac{2(\ln x)\cdot\frac{1}{x}}{3x^2}$

(a) 0 ______ (correct)

(b) 1

(c) ∞

(d) $\frac{2}{3}$

(e) $\frac{2}{9}$

$\overset{\text{Simplify}}{=} \lim_{x\to\infty} \frac{2}{3}\cdot\frac{\ln x}{x^3}$

$\overset{L'R}{=} \lim_{x\to\infty} \frac{2}{3}\cdot\frac{\frac{1}{x}}{3x^2}$

$\overset{\text{Simplify}}{=} \lim_{x\to\infty} \frac{2}{9}\cdot\frac{1}{x^3}$

$= \frac{2}{9}\cdot 0$

$= 0$

#105, p.280, Review of Chapter 4.

14. The differential dy of the function $y = x(1-\cos x)$ is

$f(x) = x - x\cos x$

(a) $dy = (1-\cos x + x\sin x)\,dx$ ______ (correct)

(b) $dy = (1+\cos x - x\sin x)\,dx$

(c) $dy = (x-\cos x + x\sin x)\,dx$

(d) $dy = (\cos x - x\sin x)\,dx$

(e) $dy = (1 - x\sin x)\,dx$

$dy = f'(x)\,dx$

$f'(x) = 1 - [x(-\sin x) + \cos x\,(1)]$

$= 1 + x\sin x - \cos x$

$dy = (1 + x\sin x - \cos x)\,dx$

~#28
§4.3

15. The function $f(x) = x^3 - 6x^2 + 10$ is **decreasing** on the interval(s)

$f'(x) = 3x^2 - 12x$
$= 3x(x-4)$

(a) $(0,4)$ ______ (correct)

$f'(x) = 0 \Rightarrow x = 0, \ x = 4$

(b) $(0, \infty)$

(c) $(-\infty, 0)$ and $(4, \infty)$

(d) $(-\infty, 4)$

(e) $(-\infty, \infty)$

f': $+$ on $(-\infty,0)$ ↗, $-$ on $(0,4)$ ↘, $+$ on $(4,\infty)$ ↗

f is decreasing on $(0,4)$.

#39
§4.3

16. If the function $f(x) = 2x + \dfrac{1}{x}$ has a **relative maximum** at the point (a, b), then $a =$

$f'(x) = 2 - \dfrac{1}{x^2} = \dfrac{2x^2-1}{x^2}$

(a) $-\dfrac{\sqrt{2}}{2}$ ______ (correct)

$f'(x) = 0 \Rightarrow 2x^2 - 1 = 0 \Rightarrow x^2 = \frac{1}{2} \Rightarrow x = \pm \frac{1}{\sqrt{2}}$

$f'(x)$ DNE when $x = 0 \notin$ domain.

(b) $\dfrac{\sqrt{2}}{2}$

(c) 0

(d) $-\dfrac{1}{2}$

(e) $+\dfrac{1}{2}$

f': $+$ ↗, $-\frac{1}{\sqrt{2}}$, $-$ ↘, $\cancel{0}$, $-$ ↘, $\frac{1}{\sqrt{2}}$, $+$ ↗

$-\frac{1}{\sqrt{2}}$: rel. max

$\frac{1}{\sqrt{2}}$: rel. min

$a = -\dfrac{1}{\sqrt{2}} = -\dfrac{\sqrt{2}}{2}$

~Example 1

§ 4.4 17. The **number** of inflection points of the graph of $f(x) = e^{-x^2}$ is

$$f'(x) = e^{-x^2} \cdot (-2x)$$

(a) 2 ______ (correct)

(b) 1

(c) 0

(d) 3

(e) 4

$$f''(x) = e^{-x^2} \cdot (-2) + (-2x)\, e^{-x^2} \cdot (-2x)$$
$$= -2e^{-x^2} + 4x^2 e^{-x^2}$$
$$= -2e^{-x^2}(1 - 2x^2)$$

$$f''(x) = 0 \Rightarrow 1 - 2x^2 = 0 \Rightarrow x^2 = \frac{1}{2} \Rightarrow x = \pm \frac{1}{\sqrt{2}} = \pm \frac{\sqrt{2}}{2}$$

f'': $+$ on $\left(-\infty, -\frac{\sqrt{2}}{2}\right)$ ($\cup$), $-$ on $\left(-\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2}\right)$ ($\cap$), $+$ on $\left(\frac{\sqrt{2}}{2}, \infty\right)$ ($\cup$)

$-\frac{\sqrt{2}}{2}$: inf. pt $\qquad$ $\frac{\sqrt{2}}{2}$: inf. pt

~#21

§ 4.4 18. The graph of $f(x) = x\sqrt{x+2}$ is **concave upward** on the interval(s)

$$f'(x) = x \cdot \frac{1}{2\sqrt{x+2}} + \sqrt{x+2} \cdot 1$$

(a) $(-2, \infty)$ ______ (correct)

(b) $\left(-\frac{8}{3}, \infty\right)$

(c) $\left(-\frac{8}{3}, -2\right)$

(d) $\left(-\infty, -\frac{8}{3},\right)$ and $(-2, \infty)$

(e) $(-\infty, \infty)$

$$= \frac{x + 2(x+2)}{2\sqrt{x+2}}$$
$$= \frac{3x+4}{2\sqrt{x+2}}$$

$$f''(x) = \frac{1}{2} \cdot \frac{\sqrt{x+2} \cdot 3 - (3x+4) \cdot \frac{1}{2\sqrt{x+2}}}{(x+2)}$$
$$= \frac{1}{2} \cdot \frac{\frac{6(x+2) - (3x+4)}{2\sqrt{x+2}}}{(x+2)}$$
$$= \frac{1}{4} \cdot \frac{3x+8}{(x+2)\sqrt{x+2}}$$

Domain of f is $[-2, \infty)$

$$f''(x) = 0 \Rightarrow 3x + 8 = 0 \Rightarrow x = -\frac{8}{3}$$
$$f''(x) \text{ DNE} \Rightarrow x = -2$$

f'': $+$ on $(-2, \infty)$, $\cup$

f is concave up on $(-2, \infty)$

~ #18
§ 4.6

19. The **slant asymptote** of the graph of the function $f(x) = \dfrac{4x^3 + x}{2x^2 + 1}$ is given by

(a) $y = 2x$ ________________ (correct)

(b) $y = 2x - \dfrac{1}{2}$

(c) $y = \dfrac{1}{2}x + 1$

(d) $y = 4x$

(e) $y = -2x + 1$

$$\begin{array}{r} 2x \\ 2x^2+1 \overline{\smash{\big)}\,4x^3+x} \\ \underline{4x^3+2x} \\ -x \end{array}$$

S.A: $y = 2x$

~ #6, 8, 26
§ 4.8

20. The **tangent line approximation** of the function $f(x) = \sqrt{x} + \dfrac{2}{\sqrt{x}}$ at the point $(1, 3)$ is

$f(x) = x^{1/2} + 2x^{-1/2}$

(a) $y = -\dfrac{1}{2}x + \dfrac{7}{2}$ ________________ (correct)

(b) $y = \dfrac{1}{2}x + \dfrac{5}{2}$

(c) $y = -x + 4$

(d) $y = -\dfrac{1}{3}x + \dfrac{10}{3}$

(e) $y = -\dfrac{3}{2}x + \dfrac{9}{2}$

$f'(x) = \frac{1}{2}x^{-1/2} + 2 \cdot -\frac{1}{2} \cdot x^{-3/2}$

$f'(1) = \frac{1}{2} - 1 = -\frac{1}{2}$

It is

$y = f(1) + f'(1)(x-1)$

$y = 3 - \frac{1}{2}(x-1)$

$y = 3 - \frac{1}{2}x + \frac{1}{2}$

$y = -\frac{1}{2}x + \frac{7}{2}$

~ #39

§4.8 21. The measurement of the edge of a cube is found to be $8\,cm$, with a possible error of $0.02\,cm$. Using **differentials**, the possible propagated error in computing the volume of the cube is approximately equal to

(a) $3.84\,cm^3$ ______________________________ (correct)

(b) $1.92\,cm^3$

(c) $1.28\,cm^3$

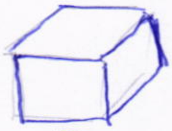
(d) $3.33\,cm^3$

(e) $2.54\,cm^3$

$V = x^3$

$\Delta V \approx dV$

$dV = 3x^2\,dx$
$= 3(8)^2(0.02)$
$= 3(64)\cdot\frac{2}{100}$
$= \frac{384}{100}$
$= 3.84$



$x = 8$
$\Delta x = 0.02$
$dx = \Delta x = 0.02$

~ #22

§4.7 22. A rectangle is to be constructed in such away that it will be bounded by the x-axis, y-axis, and the graph of the line $y = 1 - 2x$ (as shown in the figure). What is the maximum possible area of such a rectangle?

(a) $\frac{1}{8}$ ______________________________ (correct)

(b) $\frac{1}{4}$

(c) $\frac{3}{4}$

(d) $\frac{5}{3}$

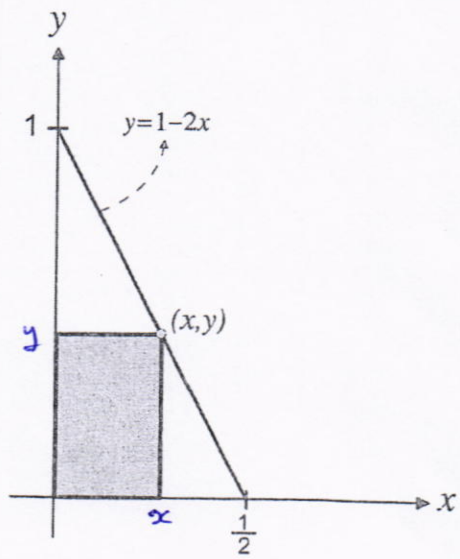
(e) $\frac{2}{3}$

$A = xy$

$A(x) = x(1-2x)$, $0 \le x \le \frac{1}{2}$
$= x - 2x^2$

$A'(x) = 1 - 4x = 0$
$\Rightarrow x = \frac{1}{4}$

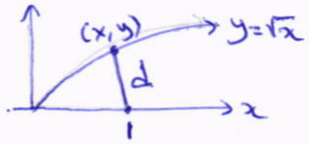
$A''(x) = \cancel{1-4x} - 4$
$A''(\frac{1}{4}) = -4 < 0 \Rightarrow$ max at $x = \frac{1}{4}$



max area is
$A(\frac{1}{4}) = \frac{1}{4} - 2(\frac{1}{4})^2$
$= \frac{1}{4} - \frac{1}{8}$
$= \frac{1}{8}$

~ #15

§4.7 23. If (a, b) is the point on the curve $y = \sqrt{x}$ that is **closest** to the point $(1, 0)$, then $ab =$



(a) $\frac{\sqrt{2}}{4}$ ______ (correct)

(b) $\sqrt{2}$

(c) $\frac{\sqrt{2}}{2}$

(d) $2\sqrt{2}$

(e) $\frac{\sqrt{2}}{3}$

$d = \sqrt{(x-1)^2 + (y-0)^2}$

$= \sqrt{(x-1)^2 + (\sqrt{x}-0)^2}$, $y = \sqrt{x}$

$d^2 = f(x) = (x-1)^2 + x$

$f'(x) = 2(x-1) + 1 = 2x - 1$

$f'(x) = 0 \Rightarrow x = \frac{1}{2}$

$f''(x) = 2 \Rightarrow f''(\frac{1}{2}) = 2 > 0 \Rightarrow$ local min at $x = \frac{1}{2}$

. $x = \frac{1}{2} \Rightarrow y = \sqrt{\frac{1}{2}} = \frac{1}{\sqrt{2}}$

The required point is $(\frac{1}{2}, \frac{1}{\sqrt{2}})$

$a = \frac{1}{2}$, $b = \frac{1}{\sqrt{2}} \Rightarrow ab = \frac{1}{2\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{2}}{4}$

#28, p.278, Review of Chapter 4

24. Which one of the following statements is **FALSE** about the graph of the function $g(x) = 2x \ln x$

Domain : $(0, \infty)$

(a) The line $x = 0$ is a vertical asymptote for the graph. ______ (correct)

(b) The graph is increasing on (e^{-1}, ∞).

(c) The graph has no horizontal asymptote. → as $\lim_{x\to\infty} g(x) = \infty$

(d) The graph is concave up on $(0, \infty)$.

(e) The graph has one local minimum.

, $g'(x) = 2(1 + \ln x) = 0 \Rightarrow x = e^{-1}$

g': 0 — $-$ ↘ — e^{-1} — $+$ ↗

↑ L. min

. $\lim_{x\to 0^+} g(x) = \lim_{x\to 0^+} 2x \ln x \quad (0 \cdot -\infty)$

$= 2 \lim_{x\to 0^+} \frac{\ln x}{\frac{1}{x}} \quad \frac{-\infty}{\infty}$

$= 2 \lim_{x\to 0^+} \frac{\frac{1}{x}}{-\frac{1}{x^2}} = 2 \lim_{x\to 0^+} -x = 2(0) = 0$

Since $\lim_{x\to 0^+} g(x) \neq \pm\infty$, then $x = 0$ is not a V.A.

. $g''(x) = \frac{2}{x} > 0$ for $x > 0$

$\Rightarrow$ graph is concave up on $(0, \infty)$

~#104
§5.6

25. If

$$f(x) = \begin{cases} (e^x + 2x)^{\frac{1}{x}} & x \neq 0 \\ c & x = 0 \end{cases}$$

is **continuous** at $x = 0$, then $c =$

$\lim_{x \to 0} f(x) = f(0)$

(a) e^3 ______ (correct)

(b) 1

(c) e^2

(d) e

(e) e^{-2}

$\Rightarrow c = \lim_{x\to 0} (e^x + 2x)^{\frac{1}{x}}$

$y = (e^x + 2x)^{\frac{1}{x}}$

$\ln y = \frac{\ln(e^x + 2x)}{x}$

$\lim_{x\to 0} \ln y = \lim_{x\to 0} \frac{\ln(e^x+2x)}{x}$ $\frac{0}{0}$

$\overset{L'R}{=} \lim_{x\to 0} \frac{\frac{1}{e^x+2x} \cdot e^x+2}{1}$

$= \lim_{x\to 0} \frac{e^x+2}{e^x+2x} = \frac{1+2}{1+0} = 3$

$\Rightarrow \lim_{x\to 0} y = e^3$

$c = e^3$

~#57
§5.6

26. $\lim_{x\to 3^+} \left(\frac{18}{x^2 - 9} - \frac{x}{x-3} \right) =$ $\infty - \infty$

$= \lim_{x\to 3^+} \left(\frac{18}{x^2-9} - \frac{x(x+3)}{x^2-9} \right)$

(a) $-\frac{3}{2}$ ______ (correct)

(b) 0

(c) ∞

(d) $-\frac{1}{6}$

(e) 1

$= \lim_{x\to 3^+} \frac{18 - x^2 - 3x}{x^2 - 9}$, $\frac{0}{0}$

$\overset{L'R}{=} \lim_{x\to 3^+} \frac{-2x-3}{2x}$

$= \frac{-6-3}{6} = -\frac{9}{6} = -\frac{3}{2}$

27. If $f''(x) = x^{-\frac{3}{2}}$, $f'(4) = 2$, $f(1) = 1$, then $f(9) =$

~ #41
§5.1

(a) 17 ________________ (correct)

$\Rightarrow f'(x) = -2x^{-1/2} + C$

$f'(4) = 2 \Rightarrow -2(4)^{-1/2} + C = 2 \Rightarrow -1 + C = 2 \Rightarrow \boxed{C = 3}$

(b) 15

(c) 13

(d) 11

(e) 9

$f'(x) = -2x^{-1/2} + 3$

$\Rightarrow f(x) = -2 \cdot 2x^{1/2} + 3x + D$

$f(1) = 1 \Rightarrow -4 + 3 + D = 1 \Rightarrow \boxed{D = 2}$

So $f(x) = -4\sqrt{x} + 3x + 2$

& $f(9) = -4 \cdot 3 + 3 \cdot 9 + 2 = -12 + 27 + 2 = 17$

~ #30, 36
§5.1

28. $\int (2x^3 - \sec^2 x)\, dx =$ $2 \cdot \frac{x^4}{4} - \tan x + C$

$= \frac{1}{2}x^4 - \tan x + C$

(a) $\frac{1}{2}x^4 - \tan x + c$ ________________ (correct)

(b) $\frac{1}{2}x^4 + \tan x + c$

(c) $2x^4 - \tan x + c$

(d) $x^4 + \tan x + c$

(e) $2x^4 - \cot x + c$

Answer KEY

Q	MASTER	CODE01	CODE02	CODE03	CODE04
1	A	E $_{5}$	A $_{2}$	E $_{7}$	B $_{6}$
2	A	B $_{6}$	E $_{7}$	A $_{5}$	E $_{2}$
3	A	D $_{3}$	B $_{5}$	B $_{6}$	E $_{4}$
4	A	A $_{2}$	C $_{1}$	D $_{1}$	E $_{5}$
5	A	C $_{7}$	B $_{6}$	D $_{4}$	D $_{7}$
6	A	C $_{4}$	A $_{3}$	C $_{3}$	E $_{3}$
7	A	C $_{1}$	D $_{4}$	E $_{2}$	B $_{1}$
8	A	D $_{13}$	D $_{14}$	D $_{9}$	B $_{12}$
9	A	C $_{14}$	E $_{13}$	C $_{12}$	D $_{8}$
10	A	D $_{8}$	A $_{12}$	E $_{13}$	D $_{14}$
11	A	C $_{12}$	C $_{9}$	E $_{10}$	B $_{13}$
12	A	D $_{11}$	C $_{10}$	B $_{14}$	E $_{10}$
13	A	D $_{9}$	B $_{8}$	E $_{11}$	D $_{9}$
14	A	D $_{10}$	A $_{11}$	C $_{8}$	A $_{11}$
15	A	C $_{15}$	C $_{15}$	E $_{18}$	B $_{19}$
16	A	E $_{17}$	A $_{20}$	A $_{15}$	B $_{16}$
17	A	E $_{16}$	A $_{19}$	B $_{16}$	B $_{15}$
18	A	E $_{21}$	D $_{18}$	C $_{17}$	C $_{20}$
19	A	A $_{18}$	D $_{17}$	C $_{21}$	E $_{17}$
20	A	B $_{20}$	E $_{16}$	A $_{20}$	B $_{18}$
21	A	E $_{19}$	D $_{21}$	A $_{19}$	B $_{21}$
22	A	C $_{22}$	A $_{23}$	E $_{23}$	E $_{24}$
23	A	E $_{28}$	C $_{24}$	E $_{28}$	C $_{23}$
24	A	B $_{24}$	A $_{27}$	D $_{24}$	E $_{28}$
25	A	B $_{26}$	B $_{26}$	E $_{27}$	D $_{26}$
26	A	E $_{23}$	C $_{22}$	B $_{22}$	C $_{27}$
27	A	E $_{25}$	E $_{28}$	E $_{26}$	C $_{25}$
28	A	E $_{27}$	E $_{25}$	A $_{25}$	D $_{22}$