ANSWERS TO TESTS FOR GAITHER/LETO INVITATIONAL FEBRUARY 22, 1997

CALCULUS	PRECALC	ALG2	GEOM	ALG 1	INT SCHOOL
1. D	1. D	1. A	1. D	1. A	1. A
2. D	2. E	2. C	2. A	2. B	2. B
3. C	3. D	3. B	3. C	3. D	3. A
4. A	4. C	4. E	4. D	4. E	4. D
5. C	5. C	5. ~~D~~ A	5. D	5. C	5. C
6. B	6. B	6. A	6. C	6. D	6. D
7. E	7. E	7. B	7. A	7. C	7. D
8. C	8. B	8. B	8. C	8. C	8. B
9. A	9. B	9. E	9. D	9. E	9. E
10. C	10. D	10. C	10. D	10. A	10. C
11. B	11. C	11. A	11. B	11. C	11. C
12. A	12. A	12. A	12. A	12. D	12. C
13. C	13. A	13. A	13. C	13. B	13. A
14. D	14. D	14. C	14. B	14. D	14. B
15. A	15. D	15. E	15. C	15. D	15. A
16. B	16. A	16. A	16. C	16. C	16. C
17. B	17. A	17. A	17. D	17. A	17. D
18. E	18. A	18. C	18. ~~X~~ E	18. B	18. B
19. D	19. D	19. D	19. D	19. A	19. C
20. A	20. A	20. B	20. B	20. A	20. A
21. D	21. B	21. A	21. C	21. B	21. D
22. C	22. D	22. C	22. B	22. D	22. C
23. D	23. C	23. C	23. D	23. D	23. E
24. B	24. B	24. D	24. B	24. B	24. D
25. A	25. C	25. A	25. A	25. E	25. D
26. D	26. E	26. B	26. C	26. A	26. C
27. B	27. C	27. B	27. A	27. C	27. B
28. E	28. C	28. C	28. D	28. B	28. B
29. A	29. A	29. A	29. C	29. D	29. E
30. A	30. B	30. C	30. A	30. C	30. A
					31. B
					32. C
					33. A
					34. A
					35. D
					36. B
					37. B
					38. B
					39. D
					40. D
					41. A
					42. E
					43. C
					44. A
					45. C

4-6 Gather-Leto-Individual – Calculus 2/22/97

D 1. $\frac{1}{2}(2x+1)^{-1/2}\cdot 2 = \frac{1}{\sqrt{2x+1}}$ $m_{tan} = 1/3$ $m_\perp = -3$ $3x+y=15$

D 2. $h'(x) = s(x)q'(x) + q(x)s'(x)$
$h''(x) = s(x)q''(x) + q'(x)s'(x) + q'(x)s''(x) + s'(x)q'(x)$

C 3. $\int \cos bx\,dx + \int e\,dx$ $\frac{1}{b}\int \cos u\,du = \frac{\sin u}{b}+C$ $u = bx$, $du = b\,dx$ $\frac{\sin bx}{b} + ex + C$ $\frac{\sin bx + bex}{b} + C$

A 4. $\frac{d}{dx}[2^{x^2}] = 2^{x^2}\cdot 2x\cdot \ln 2$

C 5. s' is odd s'' is even

B 6. $4\times 70 = 280$ $\int_1^{e^3} \frac{2}{x} = |_1^{e^3} 2\ln x = 6-0 = 6$ $\frac{6}{280} = \frac{3}{140}$

E 7. $3y^2y' - xy' - y + \cos(xy)[xy' + y] = 0$ $(0,2)$
$12y' - 2 + 2 = 0$ $y' = 0$

C 8. $\lim_{x\to 0} \frac{2x}{14x(x^2+1)} = \frac{1}{7}$

A 9. $s'(x) = 10x + 10$ $4 = 2e^{2x}$ $8x - y = 8\ln 2 - 4$ $\frac{|8(-1) + (-1)(-2) - 8\ln 2 + 4|}{\sqrt{65}}$
$s'(-1) = -2$ $x_{min} = -3$

C 10. acceleration changed from $-$ to $+$ $\therefore$ velocity has a min.

B 11. $V = 4/3\,\pi(\frac{d}{2})^3$
$\frac{dV}{dt} = \frac{\pi d^2}{2}\frac{dd}{dt}$ $6 = \frac{\pi(100)}{2}\frac{dd}{dt}$ $6 = 50\pi\left(\frac{dd}{dt}\right)$ $\frac{dd}{dt} = \frac{3}{25\pi}$

A 12. $\int \sin(2y)\,dy = 5\int \cos(3x)\,dx$ $-\frac{1}{2}(-\frac{1}{2}) = \frac{1}{3}(-1) + C$ $-\frac{1}{2}\cos(2y) = \frac{1}{3}\sin(3x) + \frac{7}{12}$
$-\frac{1}{2}\cos(2y) = \frac{1}{3}\sin 3x + C$ $1/4 = -1/3 + C$ $C = 7/12$ $-6\cos(2y) = 4\sin(3x) + 7$

C 13. Use calculator D 14. $y' = 3x^2 + 4bx + c$ $\sqrt{16b^2 - 4(3)c}$ $16b^2 - 12ac < 0$ $4b^2 - 3ac < 0$
$b^2 < \frac{3c}{4}$ $|b| < \sqrt{3}c/2$

A 15. $\int_0^{.91482} [2\ln(x+1) - \tan x]\,dx$

B 16. $s'(x) = x\cdot\frac{1}{\ln a}\cdot x + \log_a x$ $s''(x) = \frac{1}{\ln a}\cdot x$ $s'(x) = \frac{1}{\ln a}x + \log_a x$ since $x>0$, $s''(x)>0$ when $\ln a > 0$ $\therefore a > 1$

B 17. $u = x^2+7$ $du = 2x\,dx$ $\frac{1}{2}\int u^{-1/2}\,du = u^{1/2} + C$ $\sqrt{x^2+7} + C$

E 18. x; $x-16$ $s(x) = x^2 - 16x$ $s'(x) = 2x - 16$ $x = 8$ $8 - 16 = -8$ $a+b = 0$

D 19. $\sqrt{x} = \frac{1}{4}x + 1$ $16x = x^2 + 8x + 16$ $x^2 - 8x + 16 = 0$ $(x-4)^2 = 0$ $x = 4$, $y = 2$ $4+2=6$
$4\sqrt{y} = x + 4$

A 20. $\frac{1}{b-a}\int_a^b x^2\,dx = \frac{1}{b-a}|_a^b \frac{x^3}{3} = \frac{b^3-a^3}{3(b-a)} = \frac{b^2+ab+a^2}{3}$

D 21. $3x^2\left(\frac{1}{x^4}\right)(4\sec x)(\cos x) = 12x^{-2}$ $y' = -24x^{-3}$

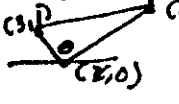
C 22. $\int_0^{24} 14{,}000\sin\left(\frac{\pi t}{24}\right)dt =$

D 23. not defined $(-1/3, 1/3)$

B 24. $\frac{\sqrt{x} - (-2)}{1} = \frac{1}{2\sqrt{x}}$ $1 = \frac{1}{2\sqrt{x}}$ $2\sqrt{x} = 1$ $\sqrt{x} = 1/2$ $x = \frac{1}{4}$

A 25. $d(7) - \int_1^4 5\,dx = |_1^4 5x = 20 - 5 = 15 = 14 - 15 = -1$

D 26. $2 = e^{3k}$ $k = \ln 2/3$ $10{,}000 = e^{\frac{\ln 2}{3}t}$ $\frac{\ln 10{,}000}{(\ln 2)/3} = t$ 39.863

B 27. 

$18 = (\sqrt{(6-x)^2+16})^2 + (\sqrt{(3-x)^2+1})^2 - 2\sqrt{(6-x)^2+16}\sqrt{(3-x)^2+1}\cos\theta$
$18 = 36 - 12x + x^2 + 16 + 9 - 6x + x^2 + 1 - 2\sqrt{x^2-12x+52}\sqrt{x^2-6x+10}\cos\theta$
$\frac{-44+18x-2x^2}{-2\sqrt{x^2-12x+52}\sqrt{x^2-6x+10}} = \cos\theta$ $\theta = \arccos\left[\frac{x^2-9x+22}{\sqrt{(x^2-12x+52)(x^2-6x+10)}}\right]$ use calc max at 4.8

A E 28. $\frac{dx}{dt} = 3t^2 - 3$ $\frac{dy}{dt} = 2t - 5$ $\frac{dy}{dx} = \frac{2t-5}{3t^2-3}$ $t = 5/2$

(A) 29. $[s^{-1}]' = \frac{1}{s'[s^{-1}(2)]}$ $2 = x^3 + 2x - 1$, $x = 1$
$s^{-1}(2) = 1 \therefore \frac{1}{s'(1)} = \frac{1}{5}$

30. $y = \int_2^x \sqrt{1+4x^2}\,dx$ $\frac{dy}{dx} = \sqrt{1+4x^2}$ $dy = \sqrt{1+4x^2}\,dx = \frac{\sqrt{17}}{10}$