



ANSWERS TO TESTS FOR GAITHER/LETO INVITATIONAL JANUARY 27, 1996

CALCULUS

- 1. D
- 2. B
- 3. C
- 4. D
- 5. B
- 6. D
- 7. B
- 8. C
- 9. D
- 10. B
- 11. D
- 12. E
- 13. A
- 14. A
- 15. E
- 16. B
- 17. B
- 18. A
- 19. B
- 20. E
- 21. A
- 22. D
- 23. B
- 24. C
- 25. C
- 26. D
- 27. E
- 28. E
- 29. B
- 30. C

PRECALCULUS

- 1. A
- 2. D
- 3. B
- 4. E
- 5. A
- 6. C
- 7. B
- 8. A
- 9. B
- 10. D
- 11. D
- 12. C
- 13. B
- 14. E
- 15. C
- 16. D
- 17. E
- 18. B
- 19. A
- 20. E
- 21. C
- 22. C
- 23. D
- 24. C
- 25. B
- 26. B
- 27. C
- 28. ~~E~~ D
- 29. A
- 30. C

ALGEBRA 2

- 1. D
- 2. C
- 3. B
- 4. D
- 5. D
- 6. C
- 7. B
- 8. D
- 9. C
- 10. B
- 11. A
- 12. D
- 13. B
- 14. D
- 15. D
- 16. B
- 17. B
- 18. A
- 19. A
- 20. D
- 21. B
- 22. B
- 23. B
- 24. A
- 25. B
- 26. C
- 27. C
- 28. D
- 29. E
- 30. A

GEOMETRY

- 1. A
- 2. A
- 3. B
- 4. C
- 5. D
- 6. D
- 7. C
- 8. B
- 9. D
- 10. E
- 11. A
- 12. E
- 13. C
- 14. C
- 15. A
- 16. B
- 17. B
- 18. B
- 19. D
- 20. C
- 21. D
- 22. D
- 23. A
- 24. D
- 25. A
- 26. B
- 27. B
- 28. B
- 29. E
- 30. C

ALGEBRA 1

- 1. D
- 2. A
- 3. B
- 4. A
- 5. B
- 6. D
- 7. C
- 8. C
- 9. D
- 10. A
- 11. B
- 12. C
- 13. E
- 14. D
- 15. C
- 16. B
- 17. A
- 18. A
- 19. B
- 20. D
- 21. D
- 22. D
- 23. A
- 24. E
- 25. C
- 26. C
- 27. A
- 28. C
- 29. B
- 30. C

Gauthier-Leto Pre Calculus Indivium

1/27/96

A 1. $\frac{17\sqrt{2}}{60} \cdot 2\pi = \frac{35}{2} \cdot \frac{1}{60} \cdot 2\pi = \frac{7\pi}{12}$

D 2. $\frac{2(x-y)-(x+y)}{4(x-y)^2-(x+y)} = \frac{2(x-y)-(x+y)}{[2(x-y)-(x+y)][2(x-y)+(x+y)]} = \frac{1}{2x-2y+x+y} = \frac{1}{3x-y}$

B 3. $D = \{x \geq \frac{1}{2} \text{ or } x \leq -\frac{1}{2}\}$ $R = \{y \geq 1\}$ $\therefore R \geq 1$

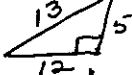
E 4. $\frac{5K-3}{2K} = \frac{20K-4}{5K+2}$ $25K^2+20K(4)+4=40K^2-8K$ $(15K+2)(K-2)=0$
 $0=15K^2-28K-4$ $K=2$ or $K=-\frac{15}{2}$

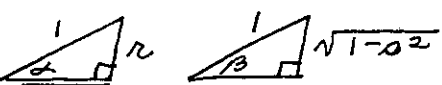
A 5. $189 \sin 76.4^\circ = 183.7$ $a \perp b \sin \theta$ $\therefore \theta$

C 6. $5 = a - b + c$ $1 = -35a - 7b$ $60 = 84a$ $26 = -7b$ $c = \frac{4}{7}$
 $4 = 36a + 6b + c$ $8 = 32a + 4b$ $57 = a$ $b = -\frac{26}{7}$ $\frac{5}{7} - \frac{26}{7} + \frac{4}{7} = -\frac{17}{7}$
 $-4 = 4a + 2b + c$ $4 = -140a - 28b$ $1 = -35(\frac{5}{7}) - 7b$ $\frac{35}{7} = \frac{21}{7} + c$
 $56 = 274a + 28b$ $1 = -25 - 7b$

B 7. $e^4 = x^2 - 1$ $e^4 + 1 = x^2$ $x = \pm \sqrt{e^4 + 1}$
 A 8. $\frac{2+3i}{3-i} \cdot \frac{3+i}{3+i} = \frac{6+11i+3i^2}{9-i^2} = \frac{3+11i}{10}$ $\frac{9+66i+12i^2}{100} = \frac{-112+66i}{100} = \frac{-56+33i}{50}$

B 9. $C = Kds^2$ $45 = K(80)(15)^2$ $K = .0025$ $.0025(120)(20)^2 = 120$

D 10. $\tan \phi = \frac{5}{12}$  $\cos \phi = \frac{12}{13}$

D 11. C 12. $\cos(\alpha + \beta) = \cos \alpha \cos \beta - \sin \alpha \sin \beta$ 
 $\frac{1}{\sqrt{1-r^2} \cdot \sqrt{1-s^2}} \cdot \frac{1}{\sqrt{1-r^2} \cdot \sqrt{1-s^2}} = \frac{1}{\sqrt{1-r^2} \cdot \sqrt{1-s^2}} = \frac{1}{\sqrt{1-r^2} \cdot \sqrt{1-s^2}}$


B 13. $\frac{1}{2} \begin{vmatrix} 0 & 2 & 1 \\ 0 & -3 & 1 \\ 2 & 3 & 1 \end{vmatrix} = \frac{1}{2} \cdot 2 \begin{vmatrix} 2 & 1 \\ -3 & 1 \end{vmatrix} = 2 - (-3) = 5$ $5 - \frac{1}{2}(1)(3) = 5 - 1.5 = 3.5$

E 14. $1 - (\frac{1}{3} + \frac{1}{5} + \frac{1}{6} + \frac{1}{7} + \frac{1}{10} + \frac{1}{30}) = 1 - \frac{41}{42} = \frac{1}{42}$

C 15. $\frac{(m+1)^{m+1}}{(m+1)!} \cdot \frac{m!}{m^m} = \frac{(m+1)^m \cdot (m+1)}{(m+1)m^m} = \frac{(m+1)^m}{m^m} = (1 + \frac{1}{m})^m$

D 16. $C(2,1) 2A = 14$ $A = 7$ $C = 4$ $16 = 49 - b^2$ $b^2 = 33$

E 17. All are true

B 18.  $\frac{6.6}{100^\circ} = \frac{x}{260^\circ}$ $\frac{6.6}{5} = 13$ $x = 17.16$ $C = 23.16$ $23.16/2\pi = r = 3.8$

A 19. $-1 + \frac{3}{4}(7 - (-1)) = -1 + 6 = 5$ $2 + \frac{3}{4}(8 - 2) = 2 + 4.5 = 6.5$ $(5, 6.5)$

E 20. $\frac{5^{2x+2} + 5^{-2x}}{4} = \frac{5^{2x-2} + 5^{-2x}}{4} = \frac{4}{4} = 1$ C 21. $\binom{10}{6} (e^x)^4 (e^{-x})^6$ seventh

C 22. $20 \sin \theta \cos \theta + 2 \cos^2 \theta - 1 = \frac{2\sqrt{2}}{2} \cdot \frac{2}{2} - \frac{2+1}{2+1} = \frac{2\sqrt{2}-2+1}{2+1}$
 $1600 = 400 + 2500 - 2(20)(50) \cos \theta$ $\frac{-1300}{-2000} = \cos \theta$ $\theta = 49.5^\circ$


D 23. $2(\frac{\sqrt{x}}{\sqrt{x+1}})(\frac{1}{\sqrt{x+1}}) + 2(\frac{1}{\sqrt{x+1}})^2 - 1 = \frac{2\sqrt{x}}{x+1} + \frac{2}{x+1} - \frac{2\sqrt{x}-2+1}{x+1}$

C 24. $\frac{x}{x+96} = \frac{2x+96}{120t_2}$ $2x+96 = 100t$ $2x+96 = 100t$ $2x+96 = 100(\frac{x}{60} + \frac{x+96}{120}) = \frac{10x+5x+480}{6}$
 $\frac{15x+480}{6} = 2x+96$ $12x+576 = 15x+480$ $3x = 96$ $x = 32$ $32+128 = 160$

B 25. $\ln(15) = t$ $20 \cdot e^{\frac{\ln(15)(14)}{40}} = 18.7$ B 26. $\sqrt{30(12)(10)(8)} = 169.7 \approx 170$

C 27. $x = 16.3$ $\tan 23.8^\circ = \frac{y}{16.3}$ $\tan 43.5^\circ = \frac{y}{16.3}$ $z+y = 22.657$

D 28. all are true $\frac{DC}{FE} = \frac{9}{AD}$ $\frac{FE}{EC} = \frac{AD}{4}$ $EC = \frac{3(FE)}{4}$ $Area \Delta FEC = \frac{1}{2}(FE)(EC) = 42$ $Area \Delta ABC = \frac{1}{2}(14)(12) = 84$

A 29.  $AD = 12$ $BE = 5$ $\Delta FEC \sim \Delta ADC$ $42 = \frac{1}{2}(FE)(\frac{3FE}{4}) \therefore FE = 4\sqrt{7}$

C 30. $(x^2+y^3)(x^3-y^3) = (x+y)(x^2-xy+y^2)(x-y)(x^2+xy+y^2)$ $x^2-2xy+y^2 = 43-6$ $(x-y)^2 = 37$ $x-y = \sqrt{37}$
 $x^2-2xy+y^2 = 43-6$ $(x-y)^2 = 37$ $x-y = \sqrt{37}$
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