1. **DATE / TIME.**
   
   **Tuesday, January 14,** from 6:00 to 8:00 p.m.
   
   Students with timetable conflicts will write the test on the same day from 4:00 p.m. to 6:00 p.m.

2. **LOCATIONS.**

   - Section **L-0101** (Prof. Abou-Ward) writes the test in room **CG-150** (Canadiana Gallery)
   - Section **L-0201** (Prof. Uppal) writes the test in room **CG-250** (Canadiana Gallery)
   - Section **L-5101** (Prof. Recio) writes the test in room **WW-111** (Woodsworth College)
   
   The 4:00 p.m. to 6:00 p.m. test, for students with timetable conflicts from any of the above sections, will be written in room **MS-3153** (Medical Sciences Building).

3. **ABOUT THE TEST.**

   Topics to be covered: textbook chapters **15 (all), and 16 (sections 16.1, 16.2, 16.3, and 16.4).**
   
   Duration: 2 hours. Value: 20% of course mark. Aids allowed: calculators or any other aids are not allowed.

4. **MATH AID CENTRES.**

   - Sidney Smith Math Aid Centre. Location: Sidney Smith Building, room SS-1071
     
     Hours of operation: Posted outside room SS-1071
     
     Note: A tutor for MAT 235 is available at this location every Wednesday from 12 noon to 2 p.m. and every Thursday from 4 p.m. to 6 p.m.
   
   - Victoria College Math Aid Centre. Location: Victoria College Building, room 006.
     
     Hours of operation: Monday to Thursday, from 12:00 noon to 3:00 p.m.
   
     
     Hours of operation: Monday to Thursday, from 12:00 noon to 3:00 p.m.
   
   - Woodsworth College Math Aid Centre. Location: Woodsworth College Building, room 115
     
     Hours of operation: Posted outside room WW-115
   
   - University College Math Aid Centre. Location: University College Building, room 048 (basement)
     
     Hours of operation: Posted outside room UC-048
   
   - New College Math Aid Centre. Location: New College Building, (basement)
     
     Hours of operation: Posted outside MAC room.

5. **TIMETABLE FOR CHAPTERS 10, 17 AND 18.**

   The following schedule (with suggested homework problems) is only tentative. Your section may become slightly ahead or behind, and your instructor may prefer a different sequence of topics or a different selection of exercises and problems.

   February 10 to March 14. Textbook sections 17.1 to 17.9. Recommended exercises:

   - 17.1: 1, 3, 5, 9, 11, 13, 15, 17, 21, 23, 25, 29, 31, 33
   - 17.2: 3, 5, 7, 9, 13, 15, 17, 19, 21, 25, 31, 33, 35, 37, 39, 41
   - 17.3: 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 27, 29, 31, 33
   - 17.4: 1, 3, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29
   - 17.5: 1, 3, 5, 7, 9, 11, 13, 15, 19, 21, 23, 25, 27, 29, 31, 33, 35
   - 17.6: 1, 3, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 29, 31, 33, 37, 41, 45, 48
   - 17.7: 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 33, 35, 37, 41, 43
   - 17.8: 1, 3, 5, 7, 9, 11, 13, 15, 17, 19
   - 17.9: 1, 3, 5, 7, 9, 11, 13, 15, 19, 21, 23, 25, 27, 29
March 17 to April 4. Textbook sections 10.3, 10.6, and 18.1 to 18.3. Recommended exercises:

10.3: 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39
10.6: 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33
18.1: 1, 3, 5, 7, 9, 11, 13, 17, 19, 21, 23, 25, 27, 33
18.2: 1, 3, 5, 7, 9, 13, 15, 17, 19, 21, 23, 25
18.3: 1, 3, 5, 9, 11, 13, 15

April 7 to April 11: Reserve / Review.

6. **LAST YEAR’S TEST #2 QUESTIONS.**

1. a) (10 marks) Find $\frac{\partial z}{\partial x}$ and $\frac{\partial z}{\partial y}$ if

$$x y \sin (y + z) + e^{x^2} = 1.$$ 

b) (10 marks) Let $f(x, y) = (x + 3y)^4$, where $x = u^2$ and $y = 2u - v$. Use the Chain Rule to evaluate $\frac{\partial f}{\partial v}$ when $u = -1$ and $v = 2$.

2. a) (10 marks) Use the linear approximation of the function $f(x, y) = e^{x^2 - 2y}$ at the point $(2, 1)$ to approximate the value of $f(2.01, 1.02)$.

b) (10 marks) Let $f(x, y, z) = x^2y - y^3z + z^2$. Find the maximum possible value of the directional derivative $D_uf(x, y, z)$ at the point $P(1, 1, 1)$.

3. (15 marks) Let $u = (x^2 + y^2)^{3/2}$. Find the value of the constant $k$ for which $u_{xx} + u_{yy} = ku^{1/3}$.

4. a) (15 marks) Find all critical points of the function $f(x, y) = x^3 - 15x + 3xy^2 + y^3$, and use the second derivative test to classify each of these critical points as a local minimum, a local maximum or a saddle point.

b) (10 marks) Find the minimum value of the function $f(x, y, z) = \frac{1}{x} + \frac{2}{y} + \frac{2}{z}$, where $x > 0$, $y > 0$, $z > 0$, subject to the constraint $4x^2 + y^2 + 8z^2 = 1$.

5. a) (10 marks) Find the volume of the solid that lies under the surface $z = 1 + x + xy$ and above the triangular region with vertices $(0, 0)$, $(1, 1)$, and $(1, 2)$ in the $xy$-plane.

b) (10 marks) Evaluate the iterated integral $\int_0^1 \int_0^1 \frac{8y^3}{1 + x^2} dx dy$. 
