

**SOLUTIONS TO PROF. BORCHERDS' 2006 FINAL**

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- (1)  $-\frac{1}{9}$
- (2)  $\frac{1-x^2}{(1+x^2)^2}$
- (3)  $\cos(\cos(\sqrt{x}))(-\sin(\sqrt{x}))\left(\frac{1}{2\sqrt{x}}\right)$
- (4)  $y' = -\frac{3x^2+2xy}{x^2+2y}$
- (5)  $3^5 7e^{3x}$
- (6) 1
- (7) 1
- (8) 5.1
- (9)  $\sec \theta$
- (10)  $-\ln(x) + (1 + \ln(2))x - \ln(2)$
- (11) -4
- (12)  $\frac{5}{2}$
- (13)  $x^2 \ln(x)$
- (14)  $\cos(x^2) + \sin(x) \cos(\cos^2(x))$
- (15)  $\frac{256}{5}$
- (16)  $1 + \frac{\pi}{4}$
- (17)  $\frac{1}{12} (2y^4 - 1)^{\frac{3}{2}}$
- (18)  $\frac{-1}{2} (\ln(\cos(x)))^2$
- (19)  $\frac{1}{4}$
- (20)  $\frac{2}{3} (1 + \sin(x))^{\frac{3}{2}}$
- (21)  $\ln(3) - \frac{2}{3}$
- (22)  $\frac{2}{3}\pi$
- (23)  $\frac{\pi}{3}$
- (24) 0

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*Date:* Monday, December 6th, 2010.