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Mathematics 5B Spring 2011: Lecture Quiz 1
April 8, 2011
Professor J. Douglas Moore

Multiple Choice. Circle the best answer to each of the following questions. Each question is worth 2 points.

1. For this question, it may be useful to know that

$$\cos\left(\frac{\pi}{6}\right) = \frac{\sqrt{3}}{2}, \quad \cos\left(\frac{\pi}{4}\right) = \frac{\sqrt{2}}{2}, \quad \cos\left(\frac{\pi}{3}\right) = \frac{1}{2}.$$

Then angle between the planes

$$x + 2y + 2z = 7 \quad \text{and} \quad x + z = 5$$

is

- a. $\pi/6$ **b. $\pi/4$** c. $\pi/3$ d. $\pi/2$ e. None of these

2. The linearization of the function

$$f(x, y) = 3 \ln(x^2 + y^2 + 1)$$

at the point (1, 2) is

- a. $\ell(x, y) = x + 2y - 5$ b. $\ell(x, y) = 2x + y - 4$
c. $\ell(x, y) = x + 2y + 3 \ln 6 - 5$ d. $\ell(x, y) = 2x + y + 3 \ln 6 - 4$

e. None of these

$$\begin{aligned} \ell(x, y) &= f(1, 2) + \frac{\partial f}{\partial x}(1, 2)(x-1) + \frac{\partial f}{\partial y}(1, 2)(y-2) \\ &= 3 \ln 6 + 1(x-1) + 2(y-2) \\ &= x + 2y + 3 \ln 6 - 5 \end{aligned}$$