KING FAHD UNIVERSITY OF PETROLEUM & MINERALS

DEPARTMENT OF MATHEMATICS & STATISTICS

MATH102 - Section 18 (Term 152)

Date: March 29, 2016 **Quiz 4** Duration: 30 minutes

Family Name: _____ **ID #:** _ _ _ _ _ _ _ _ _ _ **Serial #:** _ _

1. Determine whether each of the following integrals is convergent or divergent:

(a) $\int_0^{\infty} \frac{1}{\sqrt[4]{1+x}}\,dx$

(b) $\int_0^{1} \frac{e^{1/x}}{x^3}\,dx$

(4 + 6 = 10 points)

2. Find the arc length for the curve:

$$y^2 = 9x + 18$$

from the point $\left(0, 2\sqrt{3}\right)$ to $(2, 6)$. **(5 points)**

3. Find the area of the surface generated by the curve:

$$y^2 = 9x + 18, \qquad 0 \leq x \leq 2$$

about the $x-$ axis. **(5 points)**

KING FAHD UNIVERSITY OF PETROLEUM & MINERALS

DEPARTMENT OF MATHEMATICS & STATISTICS

MATH102 - Section 26 (Term 152)

Date: March 22, 2016 **Quiz 4** Duration: 30 minutes

Family Name: _____ **ID #:** __ __ __ __ __ __ __ __ __ **Serial #:** __ __

1. Determine whether each of the following integrals is convergent or divergent:

(a) $\int_{-2}^{3} \frac{1}{x^4} dx$

(b) $\int_{-\infty}^{\infty} xe^{-x^2} dx$

(4 + 6 = 10 points)

2. Find the arc length function for the curve:

$$y = \frac{1}{4}x^2 - \frac{1}{2}\ln x$$

taking $P_0\left(1, \frac{1}{4}\right)$ as the starting point. **(5 points)**

3. Find the area of the surface generated by the curve:

$$y = \frac{1}{4}x^2 - \frac{1}{2}\ln x\,, \qquad 2 \le x \le 6$$

about the $y-$ axis. **(5 points)**