

Name: Richard

MATH 200 - QUIZ 13

April 16, 2015

1. Find the following indefinite integrals.

$$(a) \int (4x^3 + \cos(x) + 1) dx = 4 \frac{x^4}{4} + \sin(x) + x + C = \boxed{x^4 + \sin(x) + x + C}$$

$$(b) \int \left(\sqrt{x} + \frac{1}{\sqrt{x}} \right) dx = \int \left(x^{\frac{1}{2}} + x^{-\frac{1}{2}} \right) dx = \frac{1}{\frac{1}{2}+1} x^{\frac{1}{2}+1} + \frac{1}{-\frac{1}{2}+1} x^{-\frac{1}{2}+1} + C$$

$$= \frac{1}{\frac{3}{2}} x^{\frac{3}{2}} + \frac{1}{\frac{1}{2}} x^{\frac{1}{2}} + C = \boxed{\frac{2}{3} \sqrt{x^3} + 2\sqrt{x} + C}$$

$$(c) \int \frac{\pi}{\sqrt{1-x^2}} dx = \boxed{\pi \sin^{-1}(x) + C}$$

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1. Find the following indefinite integrals.

$$(a) \int (3x^2 + \sin(x) + 3) dx = 3 \frac{x^3}{3} - \cos(x) + 3x + C = \boxed{x^3 - \cos(x) + 3x + C}$$

$$(b) \int \left(\sqrt[3]{x} + \frac{1}{x^4} \right) dx = \int \left(x^{\frac{1}{3}} + x^{-4} \right) dx = \frac{1}{\frac{1}{3}+1} x^{\frac{1}{3}+1} + \frac{1}{-4+1} x^{-4+1} + C$$

$$= \frac{1}{\frac{4}{3}} x^{\frac{4}{3}} + \frac{1}{-3} x^{-3} + C$$

$$(c) \int \frac{\pi}{1+x^2} dx = \boxed{\pi \tan^{-1}(x) + C} = \boxed{\frac{3}{4} \sqrt[3]{x^4} - \frac{1}{3x^3} + C}$$