Unit 7 Quiz 2 : (Review)

-Finding Exact Values (Non-Calc)
-Solving Trig Equations
-Integrating with Identities
-Integrating with U-sub
-Integrating with Trig Substitutions

Exact Values: Evaluate each of the following without use of a Calculator.

1.

$a)\ \sin(5\pi/4)$

$b)\ \tan^{-1}(-\sqrt{3})$

$c)\ \sec(-\pi)$

$d)\ \cos^{-1}\left(\frac{\sqrt{2}}{2}\right)$

$e)\ \cot(495°)$

$f)\ \csc^{-1}(0)$

$g)\ \tan\left(\frac{3\pi}{2}\right)$

$h)\ \sin^{-1}(-1)$

$i)\ \csc(-60°)$

$j)\ \sec^{-1}(-\sqrt{2})$

Trig Equations: Solve each of the following from $[0,2\pi]$, then state all solutions.

2.

$a)\ \sin^3\theta - \sin\theta = 0$

$b)\ \sec\theta\csc\theta = 2\csc\theta$

$c)\ 2\sec^2\theta + \tan^2\theta - 3 = 0$

$d)\ \sin^2\theta - \cos^2\theta = 1 + \cos\theta$

Integrating with Identities: Integrate each of the following using an appropriate technique.

3.

$$a)\int\left(\frac{\tan x}{\cos x}\right)dx$$

$$b)\int -\left(\frac{1}{1-\cos^2 x}\right)dx$$

$$c)\int(\sec^2 x+\tan^2 x\csc^2 x)\,dx$$

$$d)\int\ (\cos^3\theta+\sin^2\theta\cos\theta)d\theta$$

Integrating with U-Sub: Integrate each of the following using an appropriate technique.

4.

$$a)\ \int 10\csc(5x)\cot(5x)\,dx$$

$$b)\ \int 4x\cos^3(x^2)\sin(x^2)\,dx$$

$$c)\ \int \frac{\tan^5 x}{(1-\sin^2 x)}\,dx$$

$$d)\ \int \frac{e^x}{\sqrt{9-e^{2x}}}\,dx$$

$$e)\ \int \frac{\tan x \sec x}{\sec^2 x+1}\,dx$$

$$f)\ \int \frac{\sin\left(\sqrt{x}\right)}{\sqrt{x}}dx$$

Integrating with Trig Substitutions: Integrate each of the following using an appropriate technique.

5.

$$a)\int x\sin^3(x^2)dx$$

$$b)\int 2\cos^4(3x)dx$$

$$c)\int -\tan^3(x)dx$$

SOLUTIONS

1. $a)\ \frac{-\sqrt{2}}{2}$ $b)\ \frac{2\pi}{3}, \frac{5\pi}{3}$ $c)\ -1$ $d)\ \frac{\pi}{4}, \frac{7\pi}{4}$ $e)\ -1$

$f)$ *no solution* $g)$ *und* $h)\ \frac{3\pi}{2}$ $i)\ \frac{-2}{\sqrt{3}}$ $j)\ \frac{3\pi}{4}, \frac{5\pi}{4}$

2. $a)\ \theta = 0 \pm \frac{\pi}{2}k$ $b)\ \theta = \frac{\pi}{3} \pm 2\pi k, \frac{5\pi}{3} \pm 2\pi k$

$c)\ \theta = \frac{\pi}{6} \pm \pi k, \frac{5\pi}{6} \pm \pi k$

$d)\ \theta = \frac{\pi}{2} \pm \pi k, \frac{2\pi}{3} \pm 2\pi k, \frac{4\pi}{3} \pm 2\pi k$

SOLUTIONS

3. $a)\ \sec x + c$

$b)\ \cot x + c$

$c)\ 2\tan x + c$

$d)\ \sin\theta + c$

4. $a)\ -2\csc(5x) + c$

$b)\ \dfrac{-\cos^4(x^2)}{2} + c$

$c)\ \dfrac{\tan^6(x)}{6} + c$

$d)\ \sin^{-1}\left(\dfrac{e^x}{3}\right) + c$

$e)\ \tan^{-1}(\sec x) + c$

$f)\ -2\cos(\sqrt{x}) + c$

SOLUTIONS

5.

$$a)\ \frac{-1}{2}\cos(x^2)+\frac{\cos^3(x^2)}{6}+c$$

$$b)\ \frac{\sin(12x)}{48}+\frac{\sin(6x)}{6}+\frac{3}{4}x+c$$

$$c)\ \frac{-\sec^2 x}{2}-\ln|\cos x|+c$$