Please show **all** your work! Answers without supporting work will not be given credit. Write answers in spaces provided.

Name:_____

1. [**5 points**] Complete the given table. (**Exact Values Only!**)

θ	0	$\dfrac{\pi}{6}$	$\dfrac{\pi}{4}$	$\dfrac{\pi}{3}$	$\dfrac{\pi}{2}$
$\sin\theta$	$\dfrac{0}{2}=0$	$\dfrac{1}{2}$	$\dfrac{\sqrt{2}}{2}$	$\dfrac{\sqrt{3}}{2}$	$\dfrac{\sqrt{4}}{2}=1$
$\cos\theta$	$\dfrac{\sqrt{4}}{2}=1$	$\dfrac{\sqrt{3}}{2}$	$\dfrac{\sqrt{2}}{2}$	$\dfrac{1}{2}$	$\dfrac{0}{2}=0$

2. [**2 points**] Find the derivative of $y = \cos^3(2x+1)$.

Solution: Note that $y = \cos^3(2x+1) = [\cos(2x+1)]^3$. Use Chain Rule twice. So

$$y' = \underbrace{3[\cos(2x+1)]^2}_{1\text{ pt}} \cdot \underbrace{(-\sin(2x+1))}_{0.5\text{ pt}} \cdot \underbrace{2}_{0.5\text{ pt}}$$

3. [**3 points**] Compute

$$\int \frac{1+x^{2/3}}{x}\, dx$$

Solution:

$$\int \frac{1+x^{2/3}}{x}\, dx = \int \frac{1}{x} + \frac{x^{2/3}}{x}\, dx$$
$$= \int \frac{1}{x} + x^{-1/3}\, dx$$
$$= \int \frac{1}{x} + x^{-1/3}\, dx$$
$$= \ln|x| + \frac{3}{2}x^{2/3} + C$$