

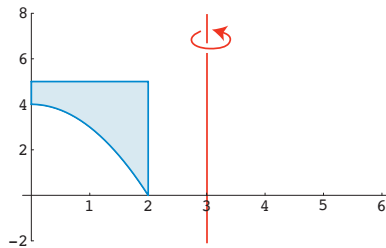
232 TEST 3

*You may use your notebook during the last fifteen minutes of this exam.
You may NOT use calculators, cell phones, loose papers, or peeking.*

Math 232
April 20, 2012

Name: _____
By printing my name I pledge to uphold the honor code.

1. Consider the region between the graph of $f(x) = 4 - x^2$ and the line $y = 5$ on $[0, 2]$, and the solid of revolution obtained by rotating this region around the line $x = 3$, as shown below. *(similar to 10.1 #41-44 and 10.2 #39-42)*



- a) Write down one or more definite integrals that represent the volume of this solid of revolution, using the disc/washer method.

DO NOT SOLVE THE INTEGRAL THAT YOU WRITE DOWN.

- b) Write down one or more definite integrals that represent the volume of this solid of revolution, using the shell method.

DO NOT SOLVE THE INTEGRAL THAT YOU WRITE DOWN.

2. Circle ALL of the following integrals that can be solved using only antiderivatives, algebra, and substitution, and cross out the others. *(basic skills)*

A) $\int \frac{1}{(x-2)^3} dx$ B) $\int \frac{1}{(x^2-2)^3} dx$ C) $\int \frac{1}{e^{2x+1}} dx$ D) $\int \frac{1}{\cos^2 x} dx$

3. Circle ALL of the following integrals that are good candidates for integration by parts, and cross out the others. *(similar to integration worksheet)*

A) $\int e^x \sin(e^x) dx$ B) $\int e^x \sin x dx$ C) $\int \sin(e^x) dx$ D) $\int e^{\sin x} dx$

4. Circle ALL of the following terms that would be part of a partial fractions decomposition of $\frac{x^2-1}{(x-1)^3(x^2+3)(x^2-4)}$, and cross out the others. *(similar to 9.3 #17-46)*

A) $\frac{A}{x^2+3}$ B) $\frac{Ax+B}{x^2-4}$ C) $\frac{A}{(x-1)^2}$ D) $\frac{Ax+B}{(x-1)^2}$

5. Circle ALL of the following integrals that can be solved by rewriting with trigonometric identities and then performing a substitution, and cross out the others. *(similar to 9.4 #21-66)*

A) $\int \cot^4 x \csc^3 x dx$ C) $\int \tan^4 x \sec^2 x dx$
B) $\int \sec^3 x \cos^4 x dx$ D) $\int \sin^2 x \cos^4 x dx$

6. Circle ALL of the following improper integrals that would need to be split into two or more integrals before solving with limits, and cross out the others. *(similar to 9.6 #21-58)*

A) $\int_1^\infty \frac{\ln x}{x} dx$ B) $\int_0^\infty \frac{x}{x^2+1} dx$ C) $\int_{-\infty}^\infty \frac{1}{x^2+1} dx$ D) $\int_1^\infty \frac{e^x}{1-e^x} dx$

7. Circle ALL of the following improper integrals that diverge by comparison with $\frac{1}{x}$, and cross out the others. *(similar to 9.6 #59-66)*

A) $\int_0^1 \frac{1}{\sqrt{x}} dx$ B) $\int_1^\infty \frac{1}{\sqrt{x}} dx$ C) $\int_0^1 \frac{1}{x^4} dx$ D) $\int_1^\infty \frac{1}{x^4} dx$

