Name: _____ Sort #: _____

Worksheet 1

Integration Review MATH 2205, Fall 2018

For problems 1 through 5 evaluate the given indefinite integrals.

1. $\int \left(\frac{6}{\sqrt{x}} + 6\sqrt{x} \right) \, dx$

2. $\int \left(\frac{3}{s^2} - 4s^8 \right) \, ds$

3. $\int (9x + 4)^2 \, dx$

4. $\displaystyle\int \frac{3x^3 + 6x^2}{x}\, dx$

5. $\displaystyle\int (\sec^2 t - 6)\, dt$

6. Solve the initial value problem $f'(x) = x^2 - 2x$ with $f(1) = \dfrac{1}{3}$.

7. Given the acceleration function of an object moving along a line, find the position function with the given initial velocity and initial position. $a(t) = 4, \quad v(0) = -3, \quad s(0) = 2$

For problems 8 through 15 use the Fundamental Theorem of Calculus to evaluate the given definite integrals.

8. $\displaystyle\int_{-2}^{3} (x^2 - x - 6)\, dx$

9. $\displaystyle\int_{0}^{2} (3x^2 + 2x)\, dx$

10. $\displaystyle\int_{0}^{\pi/4} 2\cos x\, dx$

11. $\displaystyle\int_{0}^{\ln 8} e^x\, dx$

12. $\displaystyle\int_0^{\pi} (1 - \sin x)\, dx$

13. $\displaystyle\int_0^{4} x(x-2)(x-4)\, dx$

14. $\displaystyle\int_4^{9} \frac{x - \sqrt{x}}{x^3}\, dx$

15. $\displaystyle\int_0^{1/2} \frac{1}{\sqrt{1-x^2}}\, dx$

16. Given $\displaystyle\int_2^6 f(x)\,dx = 10$ and $\displaystyle\int_2^6 g(x)\,dx = 2$, apply properties of integrals to evaluate

(a) $\displaystyle\int_2^6 \big(3g(x) - f(x)\big)\,dx.$

(b) $\displaystyle\int_2^3 \big(f(x) - g(x)\big)\,dx - \int_6^3 \big(f(x) - g(x)\big)\,dx.$