Integration Review #1

1.	$\frac{4}{3}x^3 - \frac{7}{2}x^2 + x + C$	11.	$\frac{6}{13}x^{13/6} + C$
2.	$2x - \frac{1}{16}x^{16} + C$	12.	$\frac{2}{5}x^{5/2} + 2x^{3/2} - 2x^{1/2} + C$
3.	$\frac{1}{2}x^2 + \ln\lvert x\rvert + C$	13.	$\frac{1}{3}x^3 - 4x + C$
4.	$\frac{2}{3}x^{3/2} + 2x^{1/2} + C$	14.	$\frac{4}{3}x^3 + 2x^2 + x + C$
5.	$\frac{12}{5}x^{5/2} - \frac{5}{x} + C$	15.	$\frac{1}{3}x^3 + \frac{1}{2}x^2 + x + C$
6.	$\frac{-x^{-\pi+1}}{-\pi+1} + \frac{3x^{\sqrt{2}+1}}{\sqrt{2}+1} + 3x + C$	16.	$\frac{1}{2}x^2 - 3x + C$
7.	$\sec x + \tan x + C$	17.	$\sqrt{\pi}x + C$
8.	$e\ln\lvert x\rvert + C$	18.	$-\cos x + \ln\lvert x\rvert + C$
9.	$e^{\sqrt{2}}x + C$	19.	$\frac{1}{\ln 5}5^x - \frac{1}{\ln 4}4^x + C$
10.	$10x^{2/5} + C$	20.	$-\cos x + C$

Integration Review #2

1.	$\frac{1}{2}e^{2x+5}+C$	12.	$\frac{1}{3}\sec^3 x+C$
2.	$\frac{1}{2}\ln(x^2+4)+C$	13.	$-\frac{2}{3}\cos\left(1+x^{3/2}\right)+C$
3.	$\frac{1}{3}\sqrt{2x^3+5}+C$	14.	$-\frac{2}{3}(\cot x)^{3/2}+C$
4.	$-\frac{2}{3}\cos^3 x+C$	15.	$-\tan(\cos x)+C$
5.	$\sin e^x+C$	16.	$\ln\lvert\ln x\rvert+C$
6.	$e^{\sin x}+C$	17.	$\ln\lvert\sin x\rvert+C$
7.	$\ln\lvert x+\cos x\rvert+C$	18.	$-e^{\frac{1}{x}}+C$
8.	$-\frac{1}{3}\ln\lvert 4-3x\rvert+C$	19.	$\frac{1}{2}(\tan^{-1} x)^2+C$
9.	$\frac{1}{6}\left(1+4e^x\right)^{3/2}+C$	20.	$\frac{1}{7}\left(x^3+1\right)^{7/3}-\frac{1}{4}\left(x^3+1\right)^{4/3}+C$
10.	$\frac{2}{7}(1+x)^{7/2}-\frac{4}{5}(1+x)^{5/2}+\frac{2}{3}(1+x)^{3/2}+C$	21.	$\arctan(x+1)+C$
11.	$-\frac{1}{\pi}\cos(\pi x)+C$		

Integration Bingo

1. $\frac{1}{2}(\ln x)^2 + C$

2. $\frac{1}{5}\ln(5x^2 + 7) + C$

3. $-e^{\frac{1}{x}} + C$

4. $\frac{1}{3}\tan x^3 + C$

5. $\frac{1}{2}x - \frac{1}{4}\sin(2x) + C$

6. $\tan^{-1} x + \frac{1}{2}\ln(1 + x^2) + C$

7. $-\frac{2}{3(x^3 - 1)^2} + C$

8. $\ln(e^x + e^{-x}) + C)$

9. $\frac{1}{8}(\ln x)^8 + C$

10. $\sec(\ln x) + C$

11. $\frac{2}{45}(3x - 6)^{5/2} + \frac{4}{9}(3x - 6)^{3/2} + C$

12. $\frac{4}{15}\ln(3 + 5e^{3x}) + C$

13. $\frac{1}{11}(x + 1)^{11} - \frac{1}{10}(x + 1)^{10} + C$

14. $-\frac{1}{2}\cos(2x - 4) + C$

15. $-\frac{1}{12(x^4 + 1)^3} + C$

16. $\frac{1}{6}(4x - 1)^{3/2} + C$

17. $\frac{1}{2}\sin x^2 + C$

18. $\frac{1}{6}\sin^6 x + C$

19. $\frac{1}{5}\tan^5 x + C$

20. $\frac{1}{4(5 - x^4)} + C$

21. $x - \ln|x| + C$

22. $-\frac{1}{x^5} + \frac{2}{x^2} + 2x + C$

23. $\frac{2}{5}(x + 2)^{5/2} - \frac{4}{3}(x + 2)^{3/2} + C$

24. $\ln|\sin x| + C$

Practice: Integration by Parts (Day 1)

#1 a. $-\frac{1}{2}xe^{-2x}-\frac{1}{4}e^{-2x}+C$

b. $x^3e^x-3x^2e^x+6xe^x-6e^x+C$

c. $\frac{1}{3}(\ln x)^3+C$

d. $x\sin x+\cos x+C$

e. $-x^3\cos x+3x^2\sin x+6x\cos x-6\sin x+C$

f. $x\tan^{-1}x-\frac{1}{2}\ln(1+x^2)+C$

g. $\frac{4}{5}\left(\frac{1}{2}e^{2x}sunx-\frac{1}{4}e^{2x}\cos x\right)+C$

#2 a. $\frac{-12}{e^2}+4$ OR $\frac{-12+4e^2}{e^2}$

$\frac{\pi}{2}-1$ OR $\frac{\pi-2}{2}$

Integration by Parts "Review and Renew" (Day 2)

1.	$\frac{1}{2}x^2 \ln x - \frac{1}{4}x^2 + C$	11.	$\sin x \cdot \ln(\sin x) - \sin x + C$
2.	$x \tan x + \ln\lvert\cos x\rvert + C$	12.	$-\frac{\ln x}{x} - \frac{1}{x} + C$
3.	$\frac{1}{5}x \sin 5x + \frac{1}{25}\cos 5x + C$	13.	$\frac{2}{5}(x+3)^{5/2} - 2(x+3)^{3/2} + C$
4.	$x(\ln x)^2 - 2x \ln x + 2x + C$	14.	$\frac{1}{2}x - \frac{1}{4}\sin 2x + C$
5.	$-xe^{-x} - e^{-x} + C$	15.	$-xe^{-x} - e^{-x} + C$
6.	$x \sin^{-1} x + (1-x^2)^{1/2} + C$	16.	$\frac{1}{2}\left(e^x \sin x - e^x \cos x\right) + C$
7.	$-\frac{1}{3}x \cos 3x + \frac{1}{9}\sin 3x + C$	17.	$-x^2 \cos x + 2x \sin x + 2\cos x + C$
8.	$x \ln(2x+1) - \frac{1}{2}(2x+1) + \frac{1}{2}\ln\lvert 2x+1\rvert + C$	18.	$x \ln x - x + C$
9.	$\frac{1}{2}\left[x \cos(\ln x) + x \sin(\ln x)\right] + C$	19.	$\frac{1}{5}xe^{5x} - \frac{1}{25}e^{5x} + C$
10.	$e^x(x^3 - 3x^2 + 6x - 6) + C$	20.	$\frac{1}{5}x^2 e^{5x} - \frac{2}{25}xe^{5x} + \frac{2}{125}e^{5x} + C$

Integration by Partial Fractions

1.	$x-6+6\ln\lvert x-6\rvert+C$	11.	$2\ln\lvert x\rvert-\ln\lvert x+1\rvert+C$
2.	$2\ln\lvert x+5\rvert-\ln\lvert x-2\rvert+C$	12.	$\frac{1}{2}\ln\lvert x-5\rvert-\frac{1}{2}\ln\lvert x-3\rvert+C$
3.	$-\frac{1}{5}\ln\lvert x+4\rvert+\frac{1}{5}\ln\lvert x-1\rvert+C$	13.	$\frac{3}{2}\ln\lvert 2x+1\rvert-\ln\lvert x+1\rvert+C$
4.	$-\frac{1}{2}\ln\lvert x+1\rvert+\frac{1}{2}\ln\lvert x-1\rvert+C$	14.	$2\ln\lvert x-2\rvert-\ln\lvert x-1\rvert+C$
5.	$3\ln\lvert x+2\rvert-2\ln\lvert x+1\rvert+C$	15.	$\frac{1}{3}x^3-\ln\lvert x+2\rvert+\ln\lvert x+1\rvert+C$
6.	$\frac{1}{2}x^2+x+\ln\lvert x-3\rvert+2\ln\lvert x+2\rvert+C$	16.	$-\frac{1}{3}\ln\lvert x+4\rvert+\frac{1}{3}\ln\lvert x+1\rvert+C$
7.	$3\ln\lvert x-5\rvert+C$	17.	$\frac{1}{2}x^2-3x+8\ln\lvert x+2\rvert-\ln\lvert x+1\rvert+C$
8.	$\frac{1}{2}x^2-4x+16\ln\lvert x+4\rvert+C$	18.	$x+5\ln\lvert x-2\rvert-2\ln\lvert x-1\rvert+C$
9.	$2\ln\lvert x\rvert+\frac{9}{5}\ln\lvert x+2\rvert+\frac{1}{5}\ln\lvert x-3\rvert+C$	19.	$\ln\lvert x\rvert-\ln\lvert x+1\rvert+C$
10.	$2\sqrt{x+4}-2\ln\left\lvert\sqrt{x+4}+2\right\rvert+2\ln\left\lvert\sqrt{x+4}-2\right\rvert+C$	20.	$\frac{1}{b}\ln\lvert x\rvert-\frac{1}{b}\ln\lvert ax+b\rvert+C$

Practice: L'Hopital's Rule (Day 1)

1. $\frac{1}{3}$
2. $\frac{1}{4}$
3. $\frac{5}{3}$
4. 3
5. 0
6. 2
7. ∞
8. $\frac{2}{3}$
9. 1
10. $\frac{3}{2}$
11. ∞
12. 0
13. 1
14. 0
15. 0
16. ∞

L'Hopital's Rule Worksheet

1. $\frac{1}{3}$
2. $\frac{1}{4}$
3. $\frac{5}{3}$
4. DNE, ∞
5. 0
6. 2
7. $\frac{2}{3}$
8. 1
9. $\frac{3}{2}$
10. DNE, ∞
11. 1
12. 0
13. 0
14. 0
15. 1
16. 1
17. e
18. $-\frac{3}{2}$
19. DNE
20. 0
21. 0

Practice: L'Hopital (Multiple-Choice)

1. A
2. B
3. A
4. B
5. D
6. A
7. B
8. A
9. A
10. B
11. false
12. false
13. true

Practice: Improper Integrals

1. 4

2. diverges

3. diverges

4. 6

5. 1

6. $\frac{1}{2}$

7. 1

8. diverges

9. diverges

10. 2

11. $\frac{1}{2}$

12. $\frac{1}{8(\ln 2)^2}$

13. π

14. $\frac{\pi}{4}$

Integration Review (All Methods)

1.	$4\ln\frac{5}{6}$	10.	$3\sqrt[3]{9}$
2.	$\frac{10}{7}\ln\lvert x-5\rvert+\frac{4}{7}\ln\lvert x+2\rvert+C$	11.	$\frac{p}{q}$
3.	$\frac{-2}{1+\sqrt{x}}+C$	12.	diverges
4.	$\frac{6}{25e^5}$	13.	1
5.	e^3	14.	$\frac{2}{5}(x-5)^{5/2}+\frac{10}{3}(x-5)^{3/2}+C$
6.	$\frac{3}{10}x^{5/3}-\frac{3}{16}x^{8/3}+C$	15.	$-\frac{1}{2}x^2\cos 2x+\frac{1}{2}x\sin 2x+\frac{1}{4}\cos 2x+C$
7.	$-\frac{1}{5}\ln\lvert x+3\rvert+\frac{1}{5}\ln\lvert x-2\rvert+C$	16.	0
8.	$157(x\ln x-x+C)$	17.	e
9.	$\frac{1}{3(1-x^3)}+C$	18.	$-\sqrt{1-x^2}+C$