# Worksheet for 11/18/13

Review: give some antiderivative for each function.

a) $x^{-1}$

b) $1$

c) $x$

d) $x^2$

e) $\sqrt{x}$

f) $\frac{1}{\sqrt{x}}$

g) $e^x$

h) $2^x$

i) $\cos x$

j) $\sin x$

k) $\sec^2 x$

l) $\sec x \cdot \tan x$

m) $\frac{1}{\sqrt{1-x^2}}$

n) $\frac{1}{1+x^2}$

Review these enough that you can produce them almost instantly.

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Evaluate:

(1) $\int_1^4 3\sqrt{x}\,dx$

(2) $\int_0^{\pi} 5\sin x\,dx$

(3) $\int_x^{7x} \frac{dt}{t}$ (in terms of $x$)

(4) $\int_0^{10} e^{-t}\,dt$

(5) $\int_h^1 \frac{1}{\sqrt{x}}\,dx$ (in terms of $h$)

(6) $\int_{-\pi/3}^{\pi/3} (2-\sec^2\theta)\,d\theta$

(7) $\int_{-1}^{1} \frac{1}{1+x^2}\,dx$

(8) $\int_{-1/2}^{1/2} \frac{1}{\sqrt{1-x^2}}\,dx$

## Part II

① $\int e^{-2x} dx$

② $\int \frac{1}{\sqrt{x+7}} dx$

③ $\int \cos(5x+7) dx$

④ $\int x^2 \sqrt{x^3+1}\, dx$

⑤ $\int x \cdot e^{x^2} dx$

⑥ $\int 3x \sqrt{x^2+1}\, dx$

⑦ $\int \frac{\cos x}{\sin^2 x} dx$

⑧ $\int \tan x\, dx$

(9) $\int e^x \cos(e^x)\, dx$

(10) $\int x\sqrt{x+1}\, dx$

Challenges (some will be discussed on Thursday)

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

(12) $\int \frac{e^{2x}}{e^x+1}\, dx$

(13) $\int \tan^4 x\, dx$