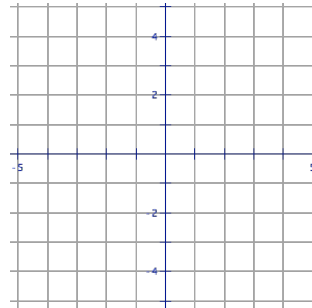


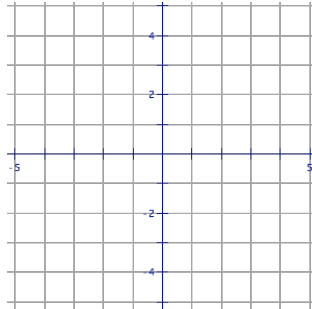
## 6.2.2 More U-Substitution

An interesting side note before we begin:

$$\lim_{x \rightarrow \infty} \int_1^x \frac{1}{t} dt$$



$$\lim_{x \rightarrow \infty} \int_1^x \frac{1}{t^2} dt$$



### U-Substitution with definite integrals

1.  $\int_1^2 \frac{2x}{(x^2 + 3)^2} dx$

2.  $\int_e^{e^4} \frac{2}{x \ln x} dx$

## 6.2.2

3. 
$$\int_0^{\pi} 4 \sin x \cos^2 x \, dx$$

4. 
$$\int_{\frac{\pi}{6}}^{\frac{\pi}{3}} -\cot x \csc^2 x \, dx$$

5. 
$$\int_0^6 \frac{20}{x^2 + 36} \, dx$$

6. 
$$\int_0^1 r \sqrt{1-r^2} \, dr$$

## 6.2.2

7. 
$$\int_{-1}^1 \frac{5x}{(4+x^2)^2} dx$$

8. 
$$\int_2^5 \frac{dx}{2x-3}$$

9. 
$$\int \frac{\sin \sqrt{x}}{\sqrt{x}} dx$$

10. 
$$\int_0^{13} \frac{dx}{\sqrt[3]{(1+2x)^2}}$$

**6.2.2**

11. 
$$\int_0^{\frac{\pi}{2}} \cos x \sin(\sin x) dx$$

12. 
$$\int_{-\frac{\pi}{6}}^{\frac{\pi}{6}} \tan^3 x dx$$