

N03: Sample Assessment Items

KEY

Possible assessment items include all of the suggested exercises above in textbook, Khan Academy, and class practice exercises.

In addition, consider the following.

Answers/solutions are included at the end of the document.

ITEMS

PART ONE

1.

1. To what family of functions does the symbol $\int x^2 dx$ refer?
(i.e. if $f(x) = x^2$ and $F'(x) = f(x)$, what is $F(x)$?)

$$\int x^2 dx = \frac{x^3}{3} + C, C \in \mathbb{R}$$

2.

2. $F'(x) = \cos(x)$. Describe the family of antiderivative functions, $F(x)$.

$$\sin(x) + C, C \in \mathbb{R}$$

3.

- To what does the symbol $\int \sin(x) dx$ refer?

$$-\cos(x) + C, C \in \mathbb{R}$$

PART TWO

Evaluate the following: $C \in \mathbb{R}$

1. $\int (10) dx = 10x + C$

2. $\int (x) dx = \frac{x^2}{2} + C$

3. $\int (3x^2) dx = x^3 + C$

$$4. \int (x^5) dx = \frac{x^6}{6} + C$$

$$5. \int (x^{-2}) dx = \frac{x^{-1}}{-1} + C = -\frac{1}{x} + C$$

$$6. \int (x^{1/2}) dx = \frac{x^{3/2}}{3/2} + C = \frac{2}{3} x^{3/2} + C$$

$$7. \int (x^{5/3}) dx = \frac{x^{8/3}}{8/3} + C = \frac{3}{8} x^{8/3} + C$$

$$8. \int \left(\frac{1}{x}\right) dx = \int x^{-1} dx = \ln |x| + C$$

$$9. \int \left(\frac{1}{x^2} + 4e^x\right) dx = \int x^{-2} dx + 4 \int e^x dx \\ = \frac{x^{-1}}{-1} + 4e^x + C = -\frac{1}{x} + 4e^x + C$$

$$10. \int \sin(x) dx = -\cos(x) + C$$

$$11. \int \cos(x) dx = \sin(x) + C$$

12. When you consider all of the different antiderivatives of function $f(x)$, how are they alike? How are they different?

They differ by a constant.

Except for the constant term, their formulas are the same.

Their graphs all have the same shape and different positions in the plane. They are vertical translations of each other.