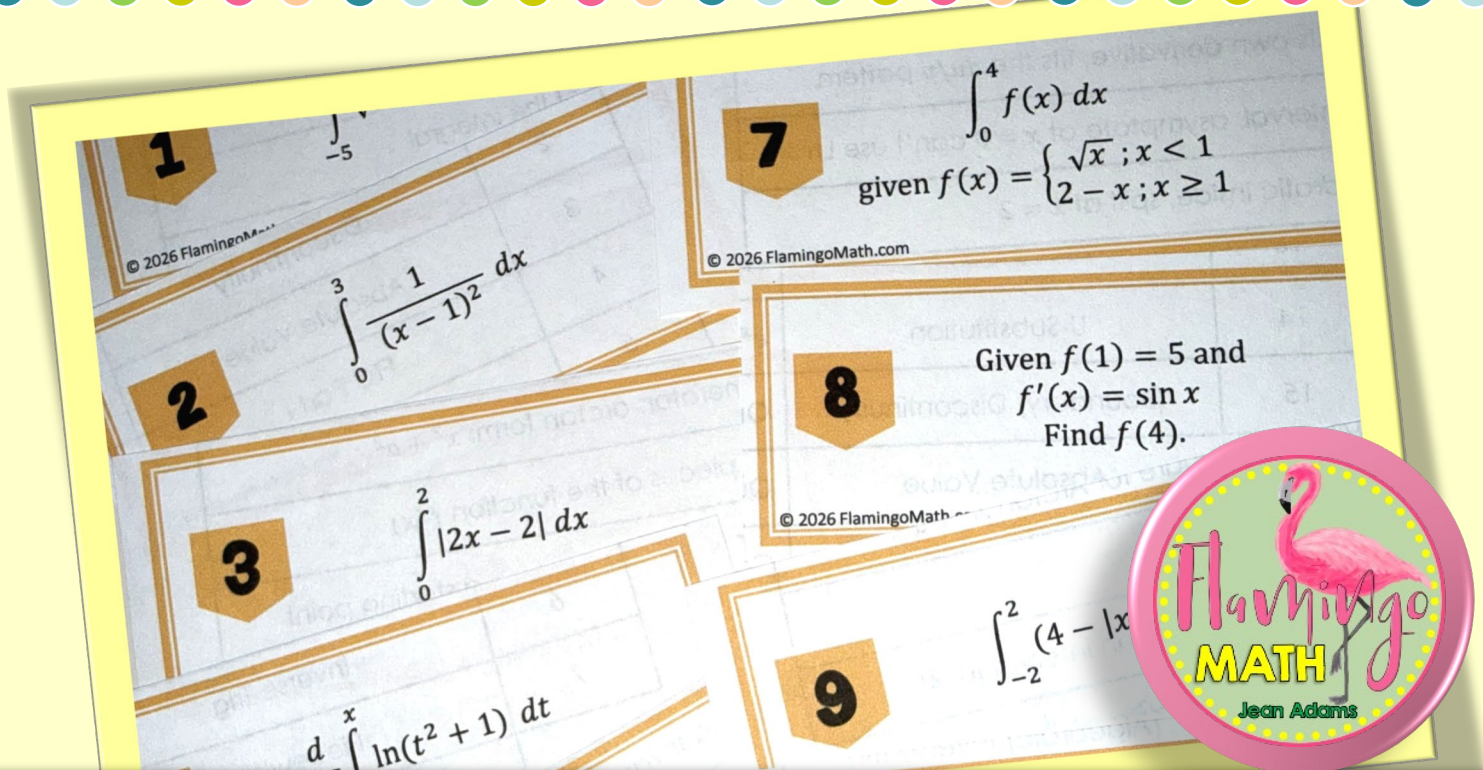
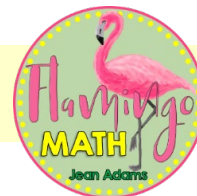


Selecting Techniques for Antidifferentiation



Task Card Sort

Selecting Techniques for Antidifferentiation



KEY CONCEPTS/TOPICS:

- ★ Determine the category that would identify how you would begin to find an antiderivative based on the family type of the integrand.

Standard:

TOPIC 6.14: Selecting Techniques for Antidifferentiation

Product Overview

Integration Family Card Sort Selecting Techniques for Antidifferentiation

Task Cards Copy a student recording sheet for supporting work, if you want that accountability on the 20 task cards. Copy each set of cards on a card stock, (Task cards 1-120). Cut apart cards and laminate for durability. Place cards in a zipped bag for organization.

GENERAL DIRECTIONS:

Students are given a set of 20 cards with an integral to select the proper category for the integrand. There is a student recording sheet to support work. There is a Flow Chart Logic handout if students need a helping hand.

EXTENSION: As an extension, students can use the 20 questions to practice the integration techniques. There is also a two-question reflection if you want to have students compare a few cards and why they are different.

Product Pages

Directions: Cut out the 16 integration cards. Sort them into the categories below. On the Student Response Page, state the category for each card and write a short reason/justification for **how you know** it belonged in that family. (e.g. "Vertical asymptote at $x = 3$ ").

Categories: Geometry, Absolute Value, Discontinuity, U-Substitution, Inverse Trigonometry, Piecewise, FTC Part I, FTC Part II

1 $\int_{-5}^5 \sqrt{25 - x^2} dx$

© 2026 FlamingoMath.com

2 $\int_0^3 \frac{1}{(x-1)^2} dx$

© 2026 FlamingoMath.com

3 $\int_0^2 |2x - 2| dx$

© 2026 FlamingoMath.com

4 $\frac{d}{dx} \left(\ln \sqrt{x^2 + 1} \right)$

© 2026 FlamingoMath.com

5 $\int \frac{x}{x^2 + 9} dx$

© 2026 FlamingoMath.com

6 $\int \frac{1}{x^2 + 9} dx$

© 2026 FlamingoMath.com

7 $\int_0^4 f(x) dx$
given $f(x) = \begin{cases} \sqrt{x}; & x < 1 \\ 2 - x; & x \geq 1 \end{cases}$

© 2026 FlamingoMath.com

8 Given $f(1) = 5$ and $f'(x) = \sin x$
Find $f(4)$.

© 2026 FlamingoMath.com

9 $\int_{-2}^2 (4 - |x|) dx$

© 2026 FlamingoMath.com

10 $\int_0^{\pi} \frac{\sin(x)}{\cos^2(x) + 1} dx$

© 2026 FlamingoMath.com

11 $\int \frac{1}{\sqrt{16 - x^2}} dx$

© 2026 FlamingoMath.com

12 $\int \frac{x^2 + 3}{x^3 - 8} dx$

© 2026 FlamingoMath.com

13 $\frac{d}{dx} \left(\int_0^x \sin t e^{t^2} dt \right)$

© 2026 FlamingoMath.com

14 $\int \frac{e^x}{1 + e^x} dx$

© 2026 FlamingoMath.com

15 $\int_{-1}^1 \frac{1}{x} dx$

© 2026 FlamingoMath.com

16 $\int_0^5 |x^2 - 4| dx$

© 2026 FlamingoMath.com

17 $\int \frac{1}{x^2 + 2x + 2} dx$

© 2026 FlamingoMath.com

18 $\int_0^1 \frac{1}{\sqrt{x}} dx$

© 2026 FlamingoMath.com

19 $\frac{d}{dx} \int_x^4 \tan(t) dt$

© 2026 FlamingoMath.com

20 $\frac{d}{dx} \int_x \tan(t) dt$

© 2026 FlamingoMath.com

Flowchart Logic Decision Tree

- Is there a variable in the limit of integration with a d/dx in front? → FTC I
- Does the integrand have a $\sqrt{r^2 - x^2}$ or a linear absolute value? → Geometry
- Is there a vertical asymptote between the lower and upper limits? → Discontinuity
- Is it a fraction?
 - Does the numerator look like the derivative of the denominator? → U-Substitution
 - Is the denominator a sum of squares or a square root of a difference of squares? → Inverse Trig
- Is there an "inner" function? → U-Substitution
- Are you asked for a specific value $f(b)$ given $f(a)$ and $f'(x)$? → FTC Part II

© 2026 FlamingoMath.com

Mixed Integration Reflection

- Compare Card 5 and Card 6. Both have $x^2 + 9$ in the denominator. What is the one specific difference that changes the method from U-Substitution to Inverse Trig Functions?

- The "Trap" Card: Look at Card 15. Why can't you just use the Power Rule or $\ln|x|$ and plug in the bounds?

© 2026 FlamingoMath.com

Integration Family Card Sort

Card #	Category	Reason/Justification/Visual Clue
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

