


6.10 Integrating with Long Division and Completing the Square

Write your questions and thoughts here!



Completing the Square and Long Division are two skills that help us manipulate the integrand until it becomes something we can work with. We are practicing those two skills in this lesson.

Using Long Division to Rewrite the Integrand:

1. $\int \frac{3x^3 - x^2 - 5x + 1}{x - 2} dx$

2. $\int \frac{6x^4 - 7x^3 + x^2 + 2x}{3x - 5} dx$

Using Completing the Square to Rewrite the Integrand:

3. $\int \frac{1}{x^2 + 6x + 10} dx$

4. $\int \frac{1}{\sqrt{-x^2 + 8x - 15}} dx$

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$$5. \int \frac{32}{x^2 - 4x + 20} dx$$

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Practice

Calculus

Find the indefinite integral.

$$1. \int \frac{4x^2}{x-2} dx$$

$$2. \int \frac{28x^2 + 33x - 35}{4x + 7} dx$$

$$3. \int \frac{1}{\sqrt{-x^2 - 4x - 3}} dx$$

$$4. \int \frac{8}{x^2 - 10x + 26} dx$$

$$5. \int \frac{6}{\sqrt{-x^2-8x-7}} dx$$

$$6. \int \frac{14x^2+11x-5}{2x+1} dx$$

$$7. \int \frac{1}{x^2-12x+37} dx$$

$$8. \int \frac{5x^3+12x^2-38x-54}{5x+7} dx$$

$$9. \int \frac{3}{x^2+14x+49} dx$$

$$10. \int \frac{x^3+2x^2+5}{x+2} dx$$

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Test Prep

$$11. \int \frac{16}{x^2-6x+25} dx$$

(A) $16 \ln|x^2 - 16x + 25| + C$

(B) $\tan^{-1}\left(\frac{x-3}{4}\right) + C$

(C) $16 \tan^{-1}(x - 3) + C$

(D) $4 \tan^{-1}\left(\frac{x-3}{4}\right) + C$

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

(A) $12 \sin^{-1}\left(\frac{x+1}{2}\right) + C$

(B) $12 \sin^{-1}\left(\frac{x-1}{2}\right) + C$

(C) $6 \sin^{-1}\left(\frac{x-1}{2}\right) + C$

(D) $6 \sin^{-1}\left(\frac{x+1}{2}\right) + C$