Topic: Power rule for negative powers

Question: Differentiate the function.

$$f(x) = x^{-2}$$

Answer choices:

$$A \qquad f'(x) = -3x^{-2}$$

B
$$f'(x) = -2x^{-3}$$

C $f'(x) = -2x^{-2}$
D $f'(x) = -2x^{-1}$

C
$$f'(x) = -2x^{-2}$$

$$D \qquad f'(x) = -2x^{-1}$$

Solution: B

Apply power rule to differentiate the function.

$$f'(x) = -2x^{-2-1}$$
$$f'(x) = -2x^{-3}$$

$$f'(x) = -2x^{-3}$$



Topic: Power rule for negative powers

Question: Differentiate the function.

$$f(x) = 3x^{-5} - 4$$

Answer choices:

A
$$f'(x) = -12x^{-6}$$

$$\mathsf{B} \qquad f'(x) = -15x^{-4}$$

$$C f'(x) = -5x^{-6}$$

$$D \qquad f'(x) = -15x^{-6}$$

Solution: D

Apply power rule to differentiate the equation, one term at a time.

$$f'(x) = 3(-5)x^{-5-1} - 0$$
$$f'(x) = -15x^{-6}$$

$$f'(x) = -15x^{-6}$$



Topic: Power rule for negative powers

Question: Differentiate the function.

$$f(x) = \frac{4}{x^2} - \frac{6}{x} + 2$$

Answer choices:

$$A f'(x) = -8x^{-3} + 6x^{-2}$$

$$B f'(x) = -8x^{-4} + 6x^{-3}$$

C
$$f'(x) = -2x^{-3} + x^{-2}$$

D
$$f'(x) = -8x^{-2} + 6x^{-1}$$

Solution: A

First, rewrite the fractions by changing the signs of the exponents.

$$f(x) = 4x^{-2} - 6x^{-1} + 2$$

Apply power rule to differentiate the equation, one term at a time.

$$f'(x) = 4(-2)x^{-2-1} - 6(-1)x^{-1-1} + 0$$

$$f'(x) = -8x^{-3} + 6x^{-2}$$

