

Chapters 6.1-6.4 Review

6.1 - nth roots and rational exponents

$$\left(\sqrt[4]{16}\right)^5 = 2^5 = 32$$

Handwritten red annotations: A tree diagram for $\sqrt[4]{16}$ showing $16 = 2^4$, $\sqrt[4]{2^4} = 2$, and $2^5 = 32$. The final result 32 is circled in red.

$$27^{-4/3} = \frac{1}{27^{4/3}} = \frac{1}{\sqrt[3]{27^4}} = \frac{1}{81}$$

Handwritten blue annotations: The expression is simplified step-by-step. $27^{-4/3}$ is written as $\frac{1}{27^{4/3}}$. Then $27^{4/3}$ is written as $\sqrt[3]{27^4}$. The final result $\frac{1}{81}$ is circled in blue.

6.2 - Properties of Rational Exponents

$$\sqrt[3]{48}$$

Handwritten red annotations for the cube root of 48. The number 48 is broken down into 2 * 2 * 3 * 2 * 2. A green circle highlights the 3, and another green circle highlights a 2. A red oval encloses the expression 2 * cube root of 6.

$$\left(\frac{x^4}{y^8} \right)^{1/2}$$

Handwritten blue annotations for the expression $\left(\frac{x^4}{y^8} \right)^{1/2}$. The expression is simplified to $\frac{(x^4)^{1/2}}{(y^8)^{1/2}}$, which is then simplified to $\frac{x^2}{y^4}$. A green circle highlights the 2 in the denominator.

6.3 - Function Operations and Compositions

$$f(x) = 3x^2 + 1 \quad g(x) = x + 4$$

$$f(x) + g(x)$$

$$(3x^2 + 1) + (x + 4)$$
$$3x^2 + x + 5$$

$$f(x) \cdot g(x)$$

$$(3x^2 + 1)(x + 4)$$
$$3x^3 + 12x^2 + x + 4$$

$$f(g(x))$$

$$f(x+4)$$
$$3(x+4)^2 + 1$$

$$3(x+4)(x+4) + 1$$

$$3(x^2 + 8x + 16) + 1$$

$$3x^2 + 24x + 49$$

6.4 - Inverse Functions

Find the inverse function of:

$$y = 3x + 7$$

$$f^{-1}(x)$$
$$f(f^{-1}(x)) = x$$

$$y = \frac{x-7}{3}$$

$$x = 3y + 7$$

$$\frac{x-7}{3} = \frac{3y}{3}$$

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