

Semester 2 Extra Practice #1

- Let $f(x) = x^2 - 1$, $g(x) = x + 2$, and $h(x) = 3x^2 + 2x - 1$. Write a simplified expression for each function in standard form. State any domain restrictions that apply.
 - $f + h$
 - $g - h$
 - $f \cdot g$
 - $\frac{f}{h}$
 - $f \circ g$
 - $h \circ g(-2)$
- Find the inverse of each function.
 - $\{(-2, 6), (3, 1), (4, -5), (2, 8)\}$
 - $g(x) = x^2 + 5$
 - $f(x) = (x - 1)^2 + 6$
 - $h(x) = 4x - 9$
- Simplify.
 - $\left(\frac{5a^3b}{15a^5b^{-1}}\right)^{-2}$
 - $\sqrt[3]{-27x^9y^4z^8}$
 - $\frac{\sqrt[3]{8x^4y^2}}{\sqrt[3]{32xy^6}}$
 - $\frac{2 - \sqrt{3}}{1 + \sqrt{3}}$
- Write using exponents:
 - $\sqrt[4]{30a^2bc^6}$
 - $\sqrt[9]{(6x^2y^3z^{12})^3}$
- Write in radical form and simplify:
 - $(4xy^2z^5)^{\frac{2}{3}}$
 - $(2ab^2)^{\frac{3}{8}}$
- Solve. Check for extraneous Solutions:
 - $\sqrt[3]{y+1} = 4$
 - $\sqrt{2x-6} = \sqrt{3+x}$
 - $\sqrt{x-6} = 3 + \sqrt{x}$
 - $(2x+1)^{\frac{2}{3}} = 9$
 - $3 = x + \sqrt{2x-3}$

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1. a) $4x^2 + 2x - 2$
 b) $-3x^2 - x + 3$
 c) $x^3 + 2x^2 - x - 2$
 d) $\frac{x-1}{3x-1}; D: x \neq -1, \frac{1}{3}$
 e) $(f \circ g)(x) = x^2 + 4x + 3$
 f) -1

2. a) $\{(6, -2), (1, 3), (-5, 4), (8, 2)\}$
 b) $g^{-1}(x) = \pm\sqrt{x-5}$
 c) $f^{-1}(x) = 1 \pm \sqrt{x-6}$
 d) $h^{-1}(x) = \frac{1}{4}x + \frac{9}{4}$

3. a) $\frac{9a^4}{b^4}$
 b) $-3x^3yz^2\sqrt[3]{yz^2}$
 c) $\frac{x\sqrt[3]{2y^2}}{2y^2}$
 d) $\frac{3\sqrt{3}-5}{2}$

4. a) $30^{\frac{1}{4}}a^{\frac{1}{2}}b^{\frac{1}{4}}c^{\frac{3}{2}}$
 b) $6^{\frac{1}{3}}x^{\frac{2}{3}}yz^4$

5. a) $2yz^3\sqrt[3]{2x^2yz}$
 b) $\sqrt[8]{8a^3b^6}$

6. a) $y = 63$
 b) $x = 9$
 c) No Solution
 d) $x=13, x=-14$
 e) $x=2$

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