Honors Trig/Pre-Calculus **Ch. 2&3 Review** **Name:** **Per:**

NO CALCULATOR!! ***SHOW ALL WORK*** **AND EXPRESS EACH ANSWER IN SIMPLEST FORM!**

1. State the domain of each function *using interval notation.*

a) $f(x) = \sqrt{x+16}$ b) $p(x) = \sqrt{14-3x}$ c) $g(x) = \dfrac{\sqrt{8-x}}{x+7}$ d) $f(x) = \dfrac{2x+3}{\sqrt{5-x}}$ e) $g(x) = \dfrac{\sqrt{5-x}}{\sqrt{x+3}}$

2. Simplify:

a) $\dfrac{4}{4x}$ b) $\dfrac{5x}{1/3}$ c) $\dfrac{-2}{4/x}$ d) $\dfrac{x-3}{1/x^2}$

3. Let $f(x) = 2 - 6x$ and $g(x) = \dfrac{2}{3x}$

a) Find $\left(\dfrac{f}{g}\right)(x)$ b) Find $(f \circ g)(x)$ c) Find $(g \circ f)(x)$

4. Use the function $f(x) = 3x^2 - 5$ to evaluate the indicated expressions.

a) $f\left(\dfrac{2}{3}\right)$ b) f(2) c) f(2x) d) 2f(x)

5. If $f(x) = 3x - 2$ and $g(x) = \dfrac{1}{6x^2}$, determine the following:

a) (f•g)(x) b) (f ∘ g)(x) c) (g ∘ f)(2)

d) $\left(\dfrac{f}{g}\right)(x)$ e) (f ∘ f)(x)

CHECK ANSWERS#1-3

$x \le \dfrac{14}{3}$ therefore $\left(-\infty, \dfrac{14}{3}\right]$

$x \ge -16$ therefore $[-16, \infty)$

$x < 5$ therefore $(-\infty, 5)$

$-3 < x \le 5$ therefore $(-3, 5]$

$x \ne -7$ and $x \le 8$ therefore $(-\infty, -7) \cup (-7, 8]$

$3x - 9x^2$ $15x$ $x^3 - 3x^2$

$-\dfrac{x}{2}$ $\dfrac{1}{x}$ $\dfrac{1}{3-9x}$ $2 - \dfrac{4}{x}$

CHECK ANSWERS#4-7

$f(x) = -2\sqrt{x+3} + 7$

$\dfrac{3x-2}{6x^2}$ $\dfrac{-11}{3}$ 7 $\dfrac{1}{96}$

$\dfrac{1}{2x^2} - 2$ $18x^3 - 12x^2$

$6x^2 - 10$ $9x - 8$ $12x^2 - 5$

$\dfrac{5x+7}{x-2}$ $\sqrt[3]{2-5x}$ $\dfrac{6x}{1-x}$

6. A function *f* is given and the indicated transformations are applied to its graph (in the given order.) Write the equation for the final transformed graph. $f(x) = \sqrt{x}$ → stretch vertically by a factor of 2, reflect across the x-axis, shift 3 units to the left, and shift upward 7 units.

7. Find the inverse of the given functions.

a) $f(x) = \dfrac{2 - x^3}{5}$ b) $g(x) = \dfrac{x}{x+6}$ c) $h(x) = \dfrac{2x+7}{x-5}$

CHECK ANSWERS: -2 -1 -1 -1 0 0 2 2 3 $\pm i$ $\pm 2i$ $\pm\sqrt{3}$

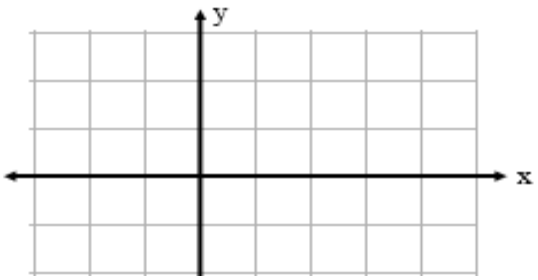
$y = 4(x + 3)^2 - 9$ $x^2 - 3x + 1$ $(x + 1)(x - 2)^3$ $x^2(x - 3)(x + 1)$ (0, 27) (3, 4) (-3, -9)

$y = 5(x - 3)^2 + 4$ $x(x^2 + 4)(x^2 - 3)$ $(x + 2)(x - 2)(x^2 + 1)$ $\left(-\frac{9}{2}, 0\right)$ $\left(-\frac{3}{2}, 0\right)$

8. Given: **$f(x) = 5x^2 - 30x + 49$**
Write the equation in standard form by completing the square, then identify the vertex.

9. Given: **$f(x) = 4x^2 + 24x + 27$**
Write the equation in standard form by completing the square, then identify x- & y-intercepts and vertex.

10. Factor, then identify the zeros of P(x) and sketch a graph. $P(x) = x^4 - 2x^3 - 3x^2$



11. Factor, then identify all real and complex zeros.
(Solve as is by factoring, no synthetic division.)

a) $P(x) = x^4 - 3x^2 - 4$

b) $R(x) = x^5 + x^3 - 12x$

12. Identify the **quotient** and the **remainder** using synthetic division:

$(x^3 - 8x + 2) \div (x + 3)$

13. Using synthetic division, **completely factor** P(x) AND find all **zeros** of $P(x) = x^4 - 5x^3 + 6x^2 + 4x - 8$