Review Sheet for Test #1

Express all answers in simplest form and interval notation, where necessary. Round answers to the nearest hundredth, where necessary.

1) Solve the absolute inequality: $|4x + 3| \leq 23$

Use algebra to find the inverse $f^{-1}(x)$.

2) $f(x) = 2x + 7$

3) $f(x) = \frac{2x-9}{8x+13}$

For 4) – 7) determine the domain of the functions.

4) $h(x) = \frac{3x^4+5x^2}{x^2-10x+21}$

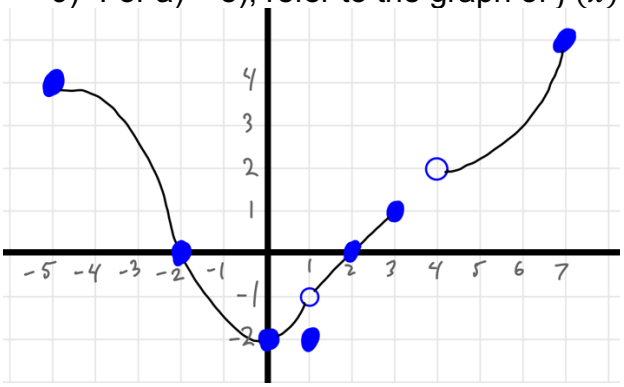
5) $g(t) = 7t\sqrt{25 - 4t}$

6) $\frac{f(x)}{g(x)}$, where $f(x) = \sqrt{3x + 10}$ and $g(x) = 2x - 12$

7) $g \odot f(x)$, where $f(x) = x - 3$ and $g(x) = \frac{1}{x^2-49}$

8) If $p(x) = 5x^2 - 12x + 32$ and $h(x) = 9x^3 - x^2$, evaluate:
   a) $h(-2)$ b) $p(9)$ c) $(h - p)(x)$ d) $\frac{p}{h}(x)$

9) For a) – e), refer to the graph of $f(x)$ below.



a) Evaluate $f(-5) + f(0)$
b) Evaluate $f^{-1}(-2)$
c) Is f(x) a one-to-one function? Why or why not?
d) Find the domain.
e) Find the range.

10) If $f(x) = x^2 + 6$ and $g(x) = \sqrt{x - 2}$, find:
   a) $f \odot g(x)$ b) $f \odot g(11)$ c) $g \odot f(x)$ d) $g \odot f(4)$ e) $f \odot f(\Psi)$

Compute the difference quotient $\frac{f(x+h)-f(x)}{h}$ for the functions.

11) $f(x) = x^2 - 4x - 3$

12) $f(x) = 3x^2 + 5$

13) For $y = x^3 + 5x^2 + 3x - 4$, $x = -4$ is a root. Factor y using polynomial division and the find the exact values of the remaining roots.

Answer Key

1) $\left[-\frac{13}{2}, 5\right]$ 2) $f^{-1}(x) = \frac{x-7}{2}$ 3) $f^{-1}(x) = \frac{-13x-9}{8x-2}$

4) $(-\infty, 3) \cup (3,7) \cup (7, \infty)$ 5) $\left[-\infty, \frac{25}{4}\right)$ 6) $\left[-\frac{10}{3}, 6\right) \cup (6, \infty)$

7) $(-\infty, -4) \cup (-4,10) \cup (10, \infty)$

8) a) -76 b) 329 c) $9x^3 - 6x^2 + 12x - 32$ d) $\frac{5x^2-12x+32}{9x^3-x^2}$

9) a) $(4) + (-2) = 2$ b) $0, 1$

c) No, it does not pass the horizontal line test

d) $[5,3] \cup (4,7]$ e) $[-2,5]$

10) a) $f\big(g(x)\big) = x + 4$ b) $f\big(g(11)\big) = 15$ c) $g\big(f(x)\big) = \sqrt{x^2 + 4}$

d) $g\big(f(4)\big) = \sqrt{20}$ e) $f\big(f(\Psi)\big) = (\Psi^2 + 6)^2 + 6$

11) $2x + h - 4$ 12) $6x + 3h$

13) $-4, \frac{-1+\sqrt{5}}{2}, \frac{-1+\sqrt{5}}{2}$