

## Exam 2 Practice Problems, set 2

1. Sketch the graphs of

(a)  $(3 - x)^3 - 2$

(b)  $|x + 2| - 1$

(c)  $\sqrt{1 - (1 - x)^2} + 2$

2. How much water needs to be added to 20 gallons of a 20% salt solution to dilute it to a 6% salt solution?

3. Solve the following inequalities and give your answer in interval notation

•  $\frac{x^2-4}{x^2+4} \geq 0$

•  $\frac{x^2-4}{x^2-1} \geq 0$

•  $\frac{x^2-4}{(x-1)^2} \geq 0$

4. Find the quadratic function with vertex  $(-2, 2)$  that passes through the point  $(0, 0)$ .

5. Solve the inequalities

•  $4x - 3 \leq 0$

•  $|4x - 3| \leq 0$

•  $|4x - 3| > 0$

6.  $f(x) = \sqrt{x + 2}, 0 \leq x \leq 2$

• What is the domain of this function?

• What is the range of this function?

• What is the average rate of change of this function on  $[0, 2]$ ?

• Sketch a graph of this function

7.  $h(z) = \frac{z-1}{z+1} + 2$ . Find  $h^{-1}(z)$ . Then write the domain and range of  $h$  and  $h^{-1}$  in interval notation.

8.  $g(x) = \sqrt{x - 3}$        $f(x) = \frac{1}{x^2 - 7}$

(a) find  $fg(x)$

(b) find  $(f \circ g)(x)$

(c) What is the domain and range of  $f \circ g$ ?

9. Find the vertex of  $f(x) = 2x^2 + 8x - 1$ . Sketch the graph of this function