

YOUR NAME: _____

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Read each problem **very carefully** before starting to solve it. Each problem is worth 10 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points. GOOD LUCK!!

1. Calculate the value or rationalize the denominators and simplify, as appropriate:

(a) $(-8)^{-4/3} =$

(b) $\frac{b}{\sqrt[3]{ab^2}} =$

(c) $\frac{2\sqrt{3}}{3\sqrt{6} - \sqrt{12}} =$

2. Solve the equation

$$\sqrt{x+7} - 2\sqrt{x} = -2.$$

3. Solve the equations:

(a)

$$2x - 5 = \sqrt{7x + 7}.$$

(b)

$$(x^2 - 2x)^2 + 24 = 11(x^2 - 2x).$$

4. Consider $f(x) = -x^2 - 4x - 3$.

(a) Find its vertex.

(b) Find its opening direction.

(c) Find its y -intercept.

(d) Find its x -intercept(s).

(e) Sketch the graph of $y = f(x)$.

5. Solve the quadratic inequality

$$x^2 - 2x - 4 \leq 0$$

and express your answer in interval notation.