

Test #3

Directions: Please show all your work since partial credit is given. Answers without the necessary work will receive no credit. And remember, have fun!

1. Solve the following equations.

a) $\sqrt[3]{4z^2 - 9z - 6} = -2$ _____

b) $t + \sqrt{7 - 3t} = 1$ _____

c) $2(x + 3)^2 - 36 = 0$ _____

d) $2r^2 = 4r - 11$ _____

e) $2x^{2/3} + 9x^{1/3} - 18 = 0$

2. Let $f(x) = \sqrt{2x + 12} - x$.

a) State the domain of $f(x)$. _____

b) Find all x such that $f(x) = 5$. That is, solve $\sqrt{2x + 12} - x = 5$. _____

3. Simplify the following expressions.

a) $a^{-1/2}(a^{1/2} - 4a^{3/2})$ _____

b) $3\sqrt{32x^2} - 2x\sqrt{2} + \sqrt{128x^2}$ _____

c) $\sqrt[3]{x^2y} \cdot \sqrt[3]{16x^4y^2}$ _____

d) $(4 - \sqrt{-49})(2 + \sqrt{-9})$ _____

4. Two joggers start from the same point at the same time, one traveling north at 9 ft/s and the other jogging west at 8 ft/s.

a) How far has each jogger traveled after just half a minute? (Hint: Use $D = R \cdot T$)

Jogger north: _____

Jogger west: _____

b) How far apart are the two joggers after half a minute? Draw a picture.

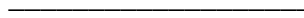
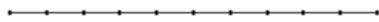
5. A less popular super hero, Super Frog, takes off from the ground. His trajectory is given by the equation $h(t) = 28t - 4t^2$, where h is his height in feet after t seconds.

- a) After how long does Super Frog land on the ground? _____
- b) Evaluate and interpret $h(3)$. _____
- c) Find the time(s) when Super Frog is 35 feet off the ground? _____

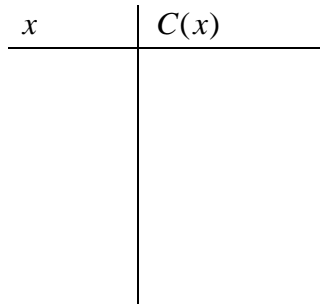
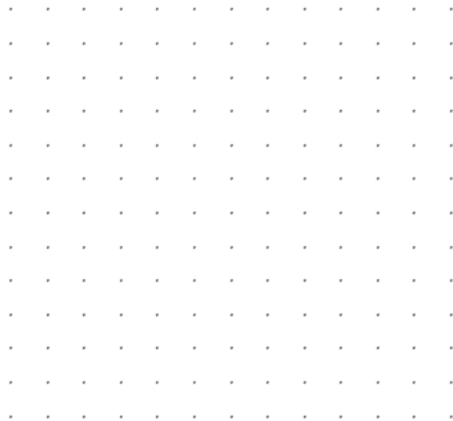
6. Solve the following *nonlinear inequalities*. Give answers in either interval or set builder notation.

c) $\frac{y-2}{2y+6} > 0$ _____

d) $(x-2)(x+4)(3x+25) \leq 0$



7. Sketch a graph of $C(x) = (x-5)^{1/3}$. Make sure to label at least 3 points on your graph.



8. Write an equation of the form $ax^2 + bx + c = 0$, where $x = \frac{11}{3}$ and $x = -7$ are solutions. In addition, make sure that a , b , and c are integers.
