

Math 114: Assignment 3 (25 points) – There are 2 pages to this assignment
Due by the time you take Exam III – Late Assignments will not be accepted.

- Do all work on a separate sheet of paper.
- You must show work to receive credit.
- Turn in work in order (#2 should come after #1, etc.)
- You may work in groups of up to 3 people. Points will be taken off, if more than 3 names are on one assignment.

1. (2 points) Write as a single radical:

a. $\sqrt[3]{z^4\sqrt[4]{z^5}\sqrt{z}}$

b. $\sqrt[3]{4\sqrt[5]{z}}$

2. (2 points) Add/Subtract the following:

a. $\sqrt{150x^5} + x\sqrt{192x} - \sqrt{108x^3} + x\sqrt{24x^3}$

b. $z \cdot \sqrt[3]{81zy^5} - y^2 \cdot \sqrt[3]{375z^4y} - \sqrt[3]{192z^4y^5}$

3. (2 points) Multiply:

a. $(5\sqrt{3x} - 2\sqrt{6x})(2\sqrt{2x} + 4\sqrt{x})$

b. $(z\sqrt{2y} - z\sqrt{3y})^2$

4. (2 points) Rationalize the denominator:

a. $\frac{2 + \sqrt[3]{6}}{\sqrt[3]{16x^2y}}$

b. $\frac{3\sqrt{x} + 5\sqrt{y}}{5\sqrt{x} - 3\sqrt{y}}$

5. (3 points) Solve the radical equations:

a. $2\sqrt{4x+1} - 9 = x - 5$

b. $\sqrt{x+2} + \sqrt{3x+7} = 1$

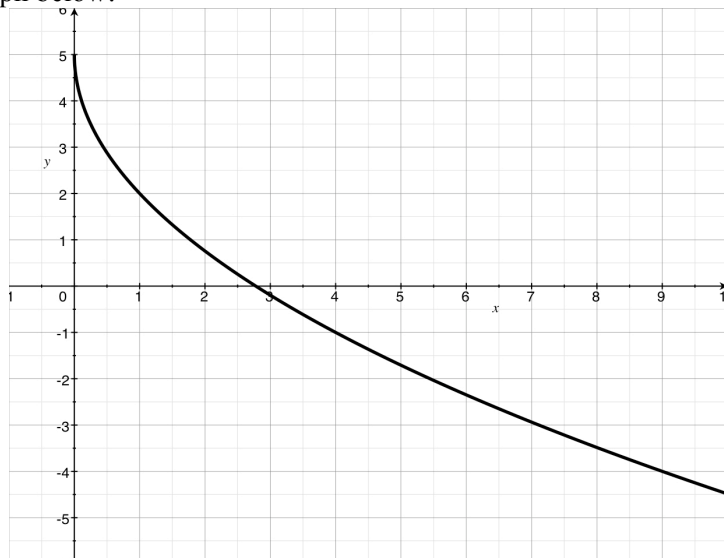
c. $\sqrt[3]{x} = \sqrt[5]{x}$

6. (3 points) Find the square root function of the form $y = a\sqrt{x} + b$:

a. That goes through the points (0,8) and (6,-1)

b. That goes through the points (4,5) and (9,14)

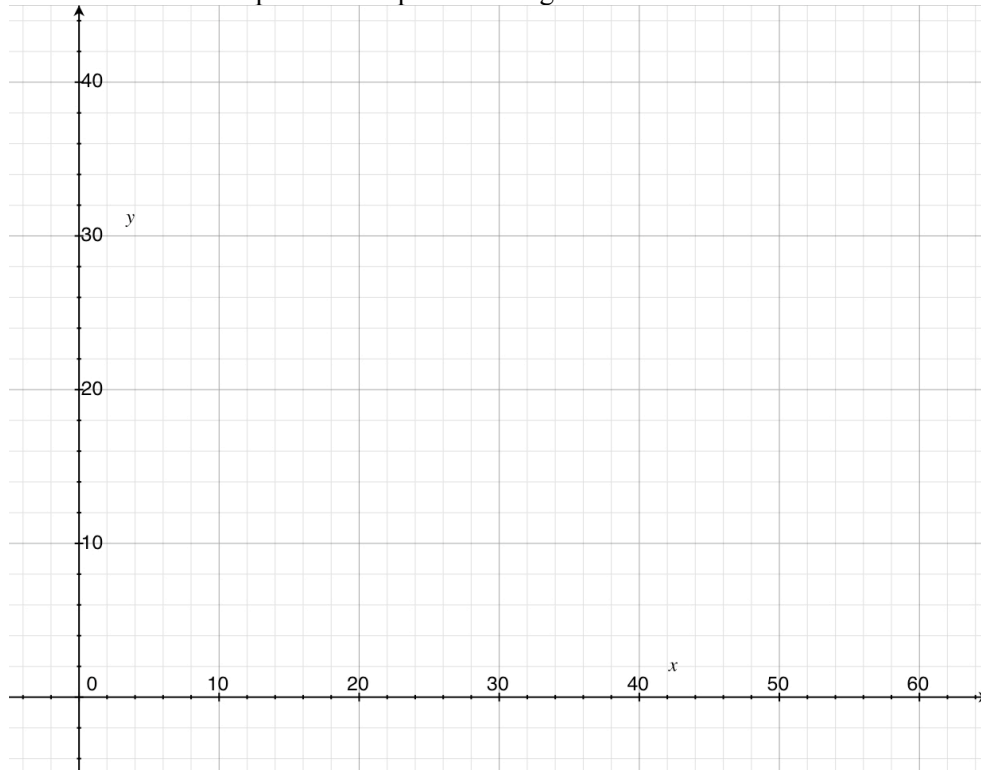
c. That is given by the graph below:



7. (3 points) Out of 50,000 births, the number who survive to age x is given by $N(x) = 5,000\sqrt{100 - x}$
- How many survive to age 50?
 - What percentage survive to the age of 50?
 - At what age will half of the group survive to?
8. (4 points) Find the given terms of the sequences below:
- Find a_1 and a_{17} of the *Arithmetic Sequence* where $a_5 = 11$ and $a_{10} = 32$.
 - Find a_1 and a_{17} of the *Geometric Sequence* where $a_5 = 11$ and $a_{10} = 32$.
9. (2 points) Find the following sums:
- $-13 - 9 - 5 - 1 + 33 + \dots + 275$
 - $0.0075 + 0.0225 + 0.0675 + \dots + 107616.8025$
10. (4 points) You get a job and are offered two options for your salary. Option A pays you \$30,000 in your 1st year, with a yearly raise of \$1,000 over the previous year's salary, every year after that. Option B pays you \$25,000 in your first year, with a yearly raise of 5% over the previous year's salary, every year after.
- Find the salary during the 20th year on the job with both options.
 - Which option pays more, total, over 20 years? *Show work to explain your choice.*
11. (2 points) The table below shows the median heights of U.S. boys at different ages (in months).

Age (months)	0	6	12	18	24	36	48	60
Height (inches)	20.5	27.0	30.8	32.9	35.0	37.5	40.8	43.4

- a. Create a scatter plot and a square root regression curve of the data.



- b. Find a possible equation of your regression curve.