

MAH Unit 9- Review WS

Solve. Check for extraneous solutions.

1) $\sqrt{3y+1} - \sqrt{y+4} = 1$

2) $\sqrt{x-1} = 2 - x$

3) $\sqrt{x+1} + \sqrt{x-1} = 1$

Solve by completing the square.

4) $3y^2 - 2y = 5$

Solve.

5) $x^2 + x - 20 > 0$

6) $|x^4 - x^3 + x^2 + 1| > 4$

7) $\sqrt[3]{x^4 - 2x^3 + 6x - 7} = x + 3$

8) $\left| \frac{2x-1}{x+5} \right| > 1$

9) $|3x^2 - 8x + 2| \leq 2$

10) A home supply store sells two models of dehumidifiers, standard and deluxe. The standard model comes in a 10 ft³ box and weighs 10 lbs., the deluxe model comes in a 9 ft³ box and weighs 12 lbs. The store's delivery van has 248 ft³ of space and can hold a maximum of 440 lbs. If the store makes a profit of \$20 on the standard model and \$30 on the deluxe model, how many boxes of each model can the van carry to maximize the profit for each load?

12) A square region is changed into a rectangular one by making it 2 feet longer and twice as wide. If the area of the rectangular region is three times larger than the area of the original square region, what was the length of a side of the square before it was changed?

13) The table shows what percent of federal aid is given in the form of loans to students at a particular college in selected years.

Year (in which school year begins)	Loans (%)
1975	18
1978	30
1984	54
1987	66
1990	78

- Find a linear model for this data, with $x=0$ corresponding to 1975.
- Interpret the meaning of the slope and the y -intercept.
- If the model remains accurate, what percentage of federal student aid were loans in 2000?

Answers:

- 1) 5 2) $\frac{5-\sqrt{5}}{2}$ 3) no solutions 4) $\frac{5}{3}, -1$ 5) $(-\infty, -5), (4, \infty)$
- 6) $(-\infty, -0.888), (1.56, \infty)$ 7) -1.733, 5.521 8) $(-\infty, -5), (-5, \frac{-4}{3}), (6, \infty)$
- 9) $[0, \frac{2}{3}]$, $[2, \frac{8}{3}]$ 10) 27 deluxe models, 0 standard models 11) 4 ft
- 12) a) $y=4x+18$, b) The slope means the percentage is increasing by 4 points each year. The y-intercept gives the percentage of loans in year 0, 1975. c) 118%