Please do all your work on a separate piece of paper. Please show all setup and work!

Word problems

1. A family has annual loan payments equaling 58.6% of their annual income. During the year, their loan payments total $13,077.75. What is their annual income?

2. The revenue for selling x units of a product is $R = 115.95x$. The cost of producing x units is $C = 95x + 750$. To obtain a profit, the revenue must be greater than the cost. For what values of x will this product return a profit?

Find all the solutions of the equation.

3. $x^4 - 4x^2 + 3 = 0$
4. $\sqrt{5 - x} - 3 = 0$

Write an inequality to represent the interval, and state whether the interval is bounded or unbounded.

5. $(2, 10]$
6. $[-5, \infty)$

Solve the inequality and sketch the solution on the real number line.

7. $-1 < 2 - \frac{x}{3} < 1$
8. $2|x + 10| \geq 9$

Find the critical numbers.

9. $2x^2 - x - 6$
10. $2 + \frac{3}{x-5}$

Solve the inequality and graph the solution on the real number line.

11. $x^2 \leq 9$
12. $x^2 + 4x + 4 \geq 9$
13. $x^3 + 2x^2 - 4x - 8 \leq 0$

Find the domain of x in the expression.

14. $\sqrt{4 - x^2}$
15. $\sqrt{x^2 - 7x + 12}$
16. $\sqrt{144 - 9x^2}$