

Show all necessary steps Clearly, Neatly, and Systematically to receive full credit.

1. (9) Suppose $f(x) = x^3 + 5x^2$ and $g(x) = 4x + 20$. Find the value of x such that $f(x) = g(x)$.
2. (9) Solve: $4z^4 - 17z^2 + 4 = 0$.
3. (9) If a rock is dropped from a building of 576 ft high, then its distance in feet from the ground t second later is a function defined by $f(t) = -16t^2 + 576$. How long after it is dropped will it hit the ground?
4. (9) The width of a rectangle is twice its length. If its width is increased by 3 in., and its length is increased by 7 in., then the area of the new rectangle is 40 in.². Find the dimensions of the original rectangle. (*make sure to show in 3-steps format*).
5. (9) Perform indicated operation: $\frac{x^3 - 27}{2x^2 + 5x - 25} \div \frac{x^3 + 3x^2 + 9x}{x^2 + 2x - 15} \cdot \frac{2x^2 - 5x}{x^2 - 6x + 9}$.
6. (9) Perform indicated operation: $\frac{x+4}{x^2 - 5x + 6} + \frac{x-1}{x^2 - 2x - 3} - \frac{2x+1}{x^2 - x - 2}$.
7. (9) Simplify: $\frac{r^{-2}s^{-1} - r^{-1}s^{-2}}{4r^{-2} - 4s^{-2}}$.
8. (9) Solve: $\frac{3}{t^2 - 5t - 6} + \frac{3}{t^2 - 7t + 6} = \frac{6}{t^2 - 1}$
9. (9) Solve: $\frac{3x+20}{x+6} < 5$. Write the solution set in interval notation and graph.
10. (9) Moo Aun can clean the whole house in 60 min. Venus can mess up it in 80 min. How long will it take for Moo Aun to clean the whole house while Venus is messing it up the same time?
11. (18) Factor Completely:

a. $a^4 - 16b^4$	d. $2g^4h + 14g^3h - 32g^2h - 224gh$
b. $(c-1)^3 - 216d^3$	e. $18(i+1)^2 - 9(i+1) - 20$
c. $24e^3f - 66e^2f - 63ef$	f. $4j^2 - 12j + 9 - k^2$