

Show all your work to receive full credit.

Problems 1-5 are worth 6 points each.

1. Factor $36x^2 - 25w^2$

2. Find any restricted values for the rational expression $\frac{5x - 2}{3x(x - 5)}$

3. Simplify the complex fraction: $\frac{\frac{9}{8x}}{\frac{3}{56x}}$

4. Solve the equation $x^2 - 36 = 0$ for x .

5. Solve the equation $z = \frac{w - q}{s}$ for the variable s .

Problems 6-20 are worth 8 points each.

Factor each of the following polynomials completely:

6. $k^2 - 4k - 5$

7. $x^3 + 6x^2 + 7x + 42$

8. $2x^2 + 7x + 3$

9. $-4m^3 + 4m$

Perform the indicated operations and simplify. Write your answers with positive exponents only:

10. $\frac{x - 4}{3x + 6} \cdot \frac{x + 2}{x^2 - 16}$

11. $\frac{5}{2x} - \frac{x}{3x^2}$

12. $\frac{3 - x}{12} \div \frac{5x - 15}{4}$

Solve the following equations. If there is no solution, state this as your answer:

13. $7x^2 + 11x - 6 = 0$

14. $(7 - x)(x + 5) = 0$

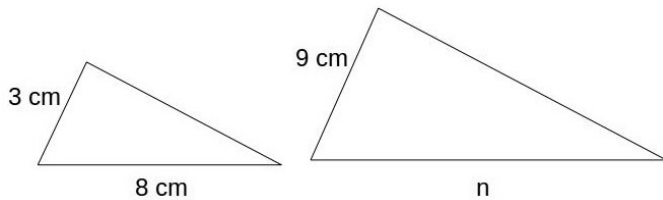
15. $y^2 + 3y = 10$

16. $x = \frac{x}{5} - \frac{8}{2}$

17. $\frac{x - 3}{8} = \frac{x + 2}{6}$

18. $\frac{5}{x^2 + 3x - 4} = \frac{2}{x + 4} + \frac{3}{x - 1}$

19. Find the unknown length n for the similar triangles:



Define a variable and use it in an equation to answer the following questions Show all steps in the solutions and label your answers.

20. The width of a rectangle is 6 inches shorter than the length. The area of the rectangle is 135 square inches. Find the dimensions of the rectangle.

EXTRA CREDIT. Each problem is worth 5 points.

1. Factor completely:

$$3y^3 + 21y^2 - 27y - 189.$$

2. Gary can weed the garden in 5 hours, while Ashlyn takes 7 hours. how long will it take them to weed the garden working together?

Define a variable and use it in an equation to answer the question. Show all steps in the solution and label your answer.