Precalculus Name:_____.

B.1 Simplify Rational Expressions (Multiply and Divide)

Simplify the rational expression, if possible. State the domain restrictions

1. $\frac{3x}{3x-6}$

2. $\frac{x+2}{4(x-3)}$

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

4. $\frac{x^2-2x-8}{x^2+7x+10}$

Multiply the expressions. Simplify the result. State the restrictions.

5. $\frac{4x^2}{3xy^3} \cdot \frac{27xy}{8x}$

6. $\frac{18x^2y^3}{7xy^2} \cdot \frac{14xy}{12x^4}$

7. $\frac{6x^3y}{xy^2} \cdot \frac{3x^2y}{8x^3}$

8. $\frac{44x^7y^4}{5xy^2} \cdot \frac{12xy^5}{22x^5y^5}$

9. $\frac{x^2-9x+20}{x^2+9x+14} \cdot \frac{x^2+6x+8}{x^2-x-20}$

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

11. $\frac{3x-3x^2}{x^2+4x-5} \cdot \frac{x^2+x-20}{3x}$

12. $\frac{x+2}{x^3-27} \cdot (x^2+3x+9)$

Divide the rational expressions. Simplify the result. State the domain restrictions.

13. $\frac{10x^4}{3xy^2} \div \frac{6x^2y}{xy^4}$

14. $\frac{16x^2y}{18xy^2} \div \frac{24x^2y}{54x^3y^3}$

15. $\frac{12y^3}{5x^2y} \div \frac{3xy}{4x^3y^2}$

16. $\frac{32x^4y}{3xy^2} \div \frac{8xy^2}{21y^4}$

17. $\frac{9x^2}{3-6x} \div \frac{3x^2-12x}{2x^2-x}$

18. $\frac{2x^2+7x-4}{x^2-6x+9} \div \frac{x^2+8x+16}{x^2+x-12}$

19. $\frac{7x}{2x-10} \div \frac{x^2-6x}{x^2-11x+30}$

20. $\frac{6x^2+x-15}{4x^2} \div 3x^2 + 5x$

Find the roots.

21. $12x^2 - 4x = 40$

22. $49x^2 - 16 = 0$

23. $14x^2 - 21x = 0$

24. $-x^2 = 6x - 10$

25. $3 - 8x - 5x^2 = 2x$

26. $7x - 5 + 12x^2 = -3x$