Reduce the following algebraic fractions to lowest terms.

1. $\frac{16n}{20n}$

2. $\frac{x^2y}{y^4x}$

3. $\frac{2n-8n^2}{4n}$

4. $\frac{db+dc}{db}$

5. $\frac{4a^2-12ab}{a^2-6ab+9b^2}$

6. $\frac{3x-2y}{9x^2-4y^2}$

Complete the following operations:

7. $\left(\frac{a^3b^2}{c^2d^2}\bullet\frac{c}{ab}\right)\div\frac{a}{c^2d^3}$

8. $\frac{6x}{4x-16}\div\frac{4x}{x^2-16}$

9. $\frac{2x^2-10x+12}{x^2-4}\bullet\frac{2+x}{3-x}$

10. $\frac{d+c}{c^2+d^2}\div\frac{c^2-d^2}{d^2-dc}$

11. $\left(\frac{x-3}{x^2-4}\right)^{-1}\bullet\left(\frac{x^2-x-6}{x-2}\right)$

12. $\frac{6x^2-11x-10}{6x^2-5x-6}\bullet\frac{6-4x}{25-20x+4x^2}$

13. $\frac{p+q}{p-q}-2$

14. $\frac{r}{s-r}+\frac{s}{r+s}$

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

16. $\frac{3n}{n-2}+\frac{3}{2-b}$

17. $\frac{b^2+1}{b^2-4}+\frac{1}{b+2}+\frac{1}{b-2}$

Solve the following equations and check for extraneous roots.

18. $\frac{4x-8}{x-2}=4$

19. $\frac{1}{p(p-4)}+1=\frac{p-6}{p}$

20. $\frac{m+5}{m^2+m}=\frac{1}{m^2+m}-\frac{m-6}{m+1}$

Solve for *x*:

21. $\sqrt{2x-5}-\sqrt{x+6}=0$

22. $\sqrt{x+12}+\sqrt{x}=6$

23. $\sqrt{x+4}=3-\sqrt{x}$

24. $x+2=4\sqrt{x-2}$

Find the equation of the parabola:

25. Focus (0,5) and Directrix y = -1

36. Focus (-2,0) and directrix y axis

27. Focus (2,4) and directrix y = -2

Find the focus and directrix for:

28. y = ½ x^2 =2

29. y = -1/4 x^2 + 1