

Write each mixed expression as a rational expression.

11. $8 + \frac{3}{n}$

12. $4 + \frac{5}{a}$

13. $2x + \frac{x}{y}$

14. $6z + \frac{2z}{w}$

15. $2m - \frac{4+m}{m}$

16. $3a - \frac{a+1}{2a}$

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

18. $r^2 + \frac{r-4}{r+3}$

19. $5n^2 - \frac{n+3}{n^2-9}$

20. $3s^2 - \frac{s+1}{s^2-1}$

21. $(x-5) + \frac{x+2}{x-3}$

22. $(p+4) + \frac{p+1}{p-4}$

Simplify each expression.

23. $\frac{5\frac{3}{4}}{7\frac{2}{3}}$

24. $\frac{8\frac{2}{7}}{4\frac{4}{5}}$

25. $\frac{\frac{a}{b^3}}{\frac{a^2}{b}}$

26. $\frac{\frac{n^3}{m^2}}{\frac{n^2}{m^2}}$

27. $\frac{\frac{x+4}{y-2}}{\frac{x^2}{y^2}}$

28. $\frac{\frac{s^3}{t^2}}{\frac{s+t}{s-t}}$

29. $\frac{\frac{y^2-1}{y^2+3y-4}}{y+1}$

30. $\frac{\frac{a^2-2a-3}{a^2-1}}{a-3}$

31. $\frac{\frac{n^2+2n}{n^2+9n+18}}{\frac{n^2-5n}{n^2+n-30}}$

32. $\frac{\frac{x^2+4x-21}{x^2-9x+18}}{\frac{x^2+3x-28}{x^2-10x+24}}$

33. $\frac{x - \frac{15}{x-2}}{x - \frac{20}{x-1}}$

34. $\frac{n + \frac{35}{n+12}}{n - \frac{63}{n-2}}$

35. What is the quotient of $b + \frac{1}{b}$ and $a + \frac{1}{a}$?

36. What is the product of $\frac{2b^2}{5c}$ and the quotient of $\frac{4b^3}{2c}$ and $\frac{7b^3}{8c^2}$?

37. **PARTIES** The student council is planning a party for the school volunteers. There are five 66-ounce bottles of soda left from a recent dance. When poured over ice, $5\frac{1}{2}$ ounces of soda fills a cup. How many servings of soda can they get from the bottles they have?