For Problems 1 - 6, find all numbers for which the rational expression is not defined.

1. $\frac{5}{4x}$

2. $\frac{9}{x+6}$

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

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

5. $\frac{4}{(x+5)^2}$

6. $\frac{x+1}{x^3-4x^2-12x}$

7. Simplify: $\frac{15x^2-x-2}{3x^2-20x-7}$

8. Multiply and simplify: $\frac{a^2-81}{4a}\cdot\frac{20a}{a+9}$.

9. Divide and simplify: $\frac{16x^2-49}{3x^2+9x}\div\frac{4x^2+x-14}{x^2+5x+6}$

10. Find the LCM: $y^2-16,\quad y^2+y-20,\quad y^2+9y+20.$

For Problems 11 - 17, add or subtract. Simplify, if possible.

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

12. $\frac{4-t}{t^2-5}-\frac{t+3}{t^2-5}$

13. $\frac{x-3}{x-8}+\frac{x-6}{8-x}$

14. $\frac{x-3}{x-8}-\frac{x-6}{8-x}$

15. $\frac{4}{t-1}+\frac{2}{t}$

16. $\frac{1}{x^2-16}-\frac{x-3}{x^2+3x-28}$

17. $\frac{1}{x+3}+\frac{4}{x^2-9}-\frac{2}{x^2-6x+9}$

18. Simplify: $\frac{4-\frac{1}{y^2}}{2-\frac{1}{y}}$

19. Solve: $\frac{9}{y} - \frac{1}{5} = \frac{1}{4}$

20. Solve: $\frac{28}{x} - \frac{28}{x-3} = -3$

21. It takes Jen 5 hours to put up paneling in a room. Marty takes 7 hours to do the same job. How long would it take them, working together, to cover the room with paneling?
ANS:

22. A sample of 240 light bulls contained 15 defective bulls. How many defective bulls would you expect in a sample of 3600 bulls?

23. Tom's snowmobile travels 5 km/h faster than Amy's. In the time that it takes Amy to travel 240km, Tom can travel 260 km. Find the speed of each snowmobile.

24. The width of a rectangle is 10 cm less than the length. The area is 56 cm^2. Find the dimensions and the perimeter of the rectangle.

25. Simplify: $\frac{(t+5)^2(t^2+12t+36)(t+4)}{(t+4)^2(t^2+10t+25)(t+6)}$