Advanced Algebra Name _____
Homework 9.1
Multiply and Divide Rational Functions Period _____

SHOW ALL WORK.

Complete Parts A & B OR Parts B & C

PART A:

Simplify the rational expression.

1. $\frac{4x^2}{20x^2-12x}$

2. $\frac{x^2+2x-24}{x^2+7x+6}$

3. $\frac{x^2-11x+24}{x^2-3x-40}$

Multiply the expressions. Simplify the result.

4. $\frac{5x^3y}{x^2y^2}\cdot\frac{y^3}{15x^2}$

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

6. $\frac{4(x+5)}{x^2}\cdot\frac{x(x+1)}{2(x+5)}$

Divide the expressions. Simplify the result.

7. $\frac{5x^2y^3}{x^7}\div\frac{30xy^4}{y^3}$

8. $\frac{8x^2y^2z}{xz^3}\div\frac{10xy}{x^4z}$

9. $\frac{(x+3)(x-2)}{x(x+1)}\div\frac{x+3}{x}$

PART B:

Simplify the rational expression.

10. $\dfrac{2x^2+2x-4}{x^2-5x-14}$

11. $\dfrac{x^2-36}{x^2+12x+36}$

12. $\dfrac{x^2+4x+4}{x^2-5x+4}$

Multiply the expressions. Simplify the result.

13. $\dfrac{3x-12}{x+5}\cdot\dfrac{x+6}{2x-8}$

14. $\dfrac{x+5}{4x-16}\cdot\dfrac{2x^2-32}{x^2-25}$

15. $\dfrac{x^2+3x-4}{x^2+4x+4}\cdot\dfrac{2x^2+4x}{x^2-4x+3}$

Divide the expressions. Simplify the result.

16. $\dfrac{x^2-6x-27}{2x^2+2x}\div\dfrac{x^2-14x+45}{x^2}$

17. $\dfrac{x^2-4x-5}{x+5}\div(x^2+6x+5)$

18. $\dfrac{3x^2+13x+4}{x^2-4}\div\dfrac{4x+16}{x+2}$

PART C:

Simplify the rational expression.

19. $\dfrac{x-4}{x^3-64}$

20. $\dfrac{5x^2+18x-8}{10x^2-x-2}$

21. $\dfrac{x^3-5x^2-3x+15}{x^2-8x+15}$

Multiply the expressions. Simplify the result.

22. $\frac{x^2-3x-10}{x^2-2x-15}\cdot(x^2+10x+21)$

23. $\frac{x^2+5x-36}{x^2-49}\cdot(x^2-11x+28)$

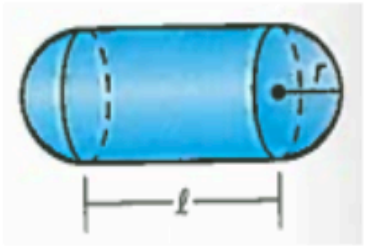
24. $\frac{4x^2+20x}{x^3+4x^2}\cdot(x^2+8x+16)$

Divide the expressions. Simplify the result.

25. $\frac{x^2-x-2}{x^2+4x-5}\div\frac{x-2}{5x+25}$

26. $\frac{x^2-8x+15}{x^2+4x}\div(x^2-x-20)$

27. A fuel storage container is shaped like a cylinder with a hemisphere on each end, as shown. The length of the cylinder is and the radius of each hemisphere is *r*. Show that the ratio of the surface area to the volume of the container is $\frac{6(2r+\ )}{r(4r+3\ )}$.



Unit 9.1 Homework Answers

1. $\frac{x}{5x-3}$ **2.** $\frac{x-4}{x+1}$ **3.** $\frac{x-3}{x+5}$ **4.** $\frac{y^2}{3x}$

5. x^2-9 **6.** $\frac{2(x+1)}{x}$ **7.** $\frac{y^2}{6x^6}$ **8.** $\frac{4x^4y}{5z}$

9. $\frac{x-2}{x+1}$ **10.** $\frac{2(x-1)}{x-7}$ **11.** $\frac{x-6}{x+6}$ **12.** already simplified.

13. $\frac{3(x+6)}{2(x+5)}$ **14.** $\frac{x+4}{2(x-5)}$ **15.** $\frac{2x(x+4)}{(x+2)(x-3)}$ **16.** $\frac{x(x+3)}{2(x-5)(x+1)}$

17. $\frac{x-5}{(x+5)^2}$ **18.** $\frac{3x+1}{4(x-2)}$ **19.** $\frac{1}{x^2+4x+16}$ **20.** already simplified.

21. $\frac{x^2-3}{x-3}$ **22.** $(x+2)(x+7)$ **23.** $\frac{(x+9)(x-4)^2}{x+7}$ **24.** $\frac{4(x+5)(x+4)}{x}$

25. $\frac{5(x+1)}{x-1}$ **26.** $\frac{x-3}{x(x+4)^2}$