1-4. Simplify the expressions

1. \( \left( \frac{-4s^6}{r^3 r^5} \right)^3 = \)

2. \( (14a^4b^6)^2 (a^6c^3)^7 = \)

\(-20xy^8 \cdot -5x^{-3}y^5 \)

3. \( \frac{3x^{-4} y^2}{(2y)^3} = \)

4. \( \frac{4x^{-3} y^2}{6xy^{-3}} \cdot \frac{y^4}{x^6 y^{-5}} = \)

5-7 Rationalize the exponents. Write your answers in radical form.

5. \( \frac{9}{a^7} \)

6. \( \frac{4}{a^7} \)

7. \( \left( -3y^\frac{1}{3} \right)^3 \)

8-10. Rationalize the denominator.

8. \( \frac{4}{3\sqrt{9x^2 y^8}} \)

9. \( \frac{2\sqrt{3}}{\sqrt{6} - \sqrt{2}} \)

10. \( \frac{5\sqrt{3} + 2\sqrt{6}}{2\sqrt{11} - 3\sqrt{6}} \)

11-12 simplify radicals

11. \( \sqrt{8x^7 y^{16} z} \)

12. \( 2a^2b^5 c\sqrt{45ab^5 c^9} \)

13-16 ADD, SUBTRACT AND MULTIPLY THE RADICAL EXPRESSION

13. \( (2 + 2\sqrt{3})(5 - \sqrt{3}) \)
14. \((4\sqrt{5} + 3\sqrt{3}) (3\sqrt{5} - 4\sqrt{3})\)
15. \(\sqrt{3} (2\sqrt{5} - 3\sqrt{2})\)
16. \(10\sqrt{63} - 2\sqrt{28} + \sqrt{7}\)

17-19 solve the radical equations
17. \(2\sqrt{2x} - 1 - 4 = -24\)
18. \(\sqrt[3]{3x - 5} = \sqrt[3]{5x} + 2\)
19. \(\sqrt[3]{3x + 10} = 5 - 2x\)

Use the following table to answer questions 20-22.

<table>
<thead>
<tr>
<th>X</th>
<th>Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>2</td>
</tr>
<tr>
<td>10</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>10</td>
</tr>
</tbody>
</table>

20. Does this show an inverse variation/proportion relationship? Explain why or why not.
21. What is the constant (k)?
22. What is the equation for this table?

23. If I am looking at an inverse relation, if y increases what happens to x? Explain what happens to y as x decreases.

24. The time it takes to fly from Los Angeles to New York varies inversely as the speed of the plane. If the trip takes 6 hours at 900 km/h, how long would it take at 800 km/h?

25. The power, \(P\), in watts of an electrical circuit varies jointly as the resistance, \(R\), and the square of the current, \(C\). For a 240-watt refrigerator that draws a current of 2 amperes, the resistance is 60 ohms. What is the resistance of a 600-watt microwave oven that draws a current of 5 amperes?

26. The force needed to keep a car from skidding on a curve varies directly as the weight of the car and the square of the speed and inversely as the radius of the curve. Suppose a 3,960 lb. force is required to keep a 2,200 lb. car traveling at 30 mph from skidding on a curve of radius 500 ft. How much force is required to keep a 3,000 lb. car traveling at 45 mph from skidding on a curve of radius 400 ft.?