

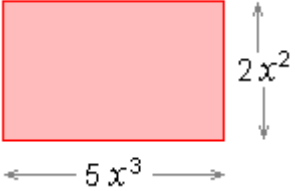
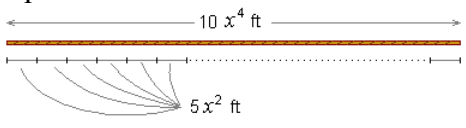
## 4.2 Exponent Laws

## Solutions

Evaluate each expression	
<p>1. <math>(1.3)^2 = \boxed{1.69}</math></p> <p style="text-align: right; margin-right: 20px;"> <math>\frac{1.3}{39}</math>  <math>\frac{13}{1.69}</math> </p>	<p>2. <math>(1.4)^2</math></p>
<p>3. <math>(-5)^2 = (-5)(-5) = \boxed{25}</math></p>	<p>4. <math>(-7)^2</math></p>
<p>5. <math>-5^2 = -5 \cdot 5 = \boxed{-25}</math></p>	<p>6. <math>-7^2</math></p>
<p>7. For <math>x = 2</math>,  <math>3x^4 = 3 \cdot 2^4 = 3 \cdot 16 = \boxed{48}</math></p>	<p>8. For <math>y = 5</math>,  <math>3y^2 =</math></p>
<p>9. For <math>x = -2</math>,  <math>3x^4 = 3 \cdot (-2)^4 = 3 \cdot 16 = \boxed{48}</math></p>	<p>10. For <math>y = -5</math>,  <math>3y^2 =</math></p>
<p>11. For <math>x = 2</math>, and <math>y = -1</math>  <math>x^2y = 2^2 \cdot (-1) = 4 \cdot (-1) = \boxed{-4}</math></p>	<p>12. For <math>x = 3</math>, and <math>y = -1</math>  <math>x^2y =</math></p>
<p>13. For <math>x = 3</math>, and <math>y = 2</math>  <math>-x^2y^3 = -3^2 \cdot 2^3 = -9 \cdot 8 = \boxed{-72}</math></p>	<p>14. For <math>x = 5</math>, and <math>y = 2</math>  <math>-x^2y^3 =</math></p>
<p>Answers: 1. 1.69; 3. 25; 5. -25; 7. 48; 9. 48; 11. -4 13. -72</p>	

Simplify.	
<b>15.</b> $x^2 \cdot x^5$ $= x^{2+5} = \boxed{x^7}$	<b>16.</b> $y^4 \cdot y^3$
<b>17.</b> $(-5x^2)(-3x^5)$ $= (-5)(-3)x^2 \cdot x^5 = 15x^{2+5} = \boxed{15x^7}$	<b>18.</b> $(-4y^3)(-2y^7)$
<b>19.</b> $(2x^2y^3)(3x^4y)$ $= 2 \cdot 3 x^2 \cdot x^4 \cdot y^3 \cdot y$ $= 6x^{2+4} \cdot y^{3+1} = \boxed{6x^6y^4}$	<b>20.</b> $(4a^2b^5)(5ab^2)$
<b>21.</b> $\frac{x^5}{x^2} = x^{5-2} = \boxed{x^3}$	<b>22.</b> $\frac{y^8}{y^3}$
<b>23.</b> $\frac{x^3}{x^7} = \frac{1}{x^{7-3}} = \boxed{\frac{1}{x^4}}$	<b>24.</b> $\frac{y}{y^4}$
<b>Answers:</b> 15. $x^7$ ; 17. $15x^7$ ; 19. $6x^6y^4$ ; 21. $x^3$ ; 23. $\frac{1}{x^4}$	

Simplify	
<p>25. <math>\frac{-2a^7}{6a^3}</math></p> $= \frac{-2}{6} \cdot \frac{a^7}{a^3} = -\frac{1}{3}a^{7-3} = \boxed{-\frac{1}{3}a^4 \text{ or } -\frac{a^4}{3}}$	<p>26. <math>\frac{2y^7}{-8y^8}</math></p>
<p>27. <math>\frac{15a^4b}{10ab^2}</math></p> $= \frac{15}{10} \cdot \frac{a^4}{a} \cdot \frac{b}{b^2}$ $= \frac{3}{2} \cdot a^3 \cdot \frac{1}{b} = \boxed{\frac{3a^3}{2b}}$	<p>28. <math>\frac{12x^5y^4}{8x^6y}</math></p>
<p>29. <math>\left(\frac{a}{2}\right)^3</math></p> $= \frac{a^3}{2^3} = \boxed{\frac{a^3}{8}}$	<p>30. <math>\left(\frac{x}{2}\right)^4</math></p>
<p>31. <math>(x^4)^5</math></p> $= x^{4 \cdot 5} = \boxed{x^{20}}$	<p>32. <math>(y^5)^3</math></p>
<p>33. <math>(3xy)^4</math></p> $= 3^4 x^4 y^4 = \boxed{81x^4y^4}$	<p>34. <math>(2ab)^5</math></p>
<p>35. <math>(-3x^4)^2</math></p> $= (-3)^2 (x^4)^2 = 9x^{4 \cdot 2} = \boxed{9x^8}$	<p>36. <math>(-5y^6)^2</math></p>
<p>Answers: 25. <math>-\frac{a^4}{3}</math>; 27. <math>\frac{3a^3}{2b}</math>; 29. <math>\frac{a^3}{8}</math>; 31. <math>x^{20}</math>; 33. <math>81x^4y^4</math>; 35. <math>9x^8</math></p>	

Simplify	
<p>37. <math>(3ab^2)(2a^2b^3)^4</math></p> $= (3ab^2) \cdot 2^4 (a^2)^4 \cdot (b^3)^4$ $= (3ab^2) \cdot 2^4 \cdot a^8 \cdot b^{12}$ $= 3 \cdot 16 \cdot a \cdot a^8 \cdot b^2 \cdot b^{12} = 48a^9 b^{14}$	<p>38. <math>(2xy^4)(5x^3y^4)^2</math></p>
<p>39. <math>\frac{(2xy^3)^4}{8x^4y} = \frac{2^4 x^4 y^{12}}{8x^4y}</math></p> $= \frac{16}{8} \cdot \frac{x^4}{x^4} \cdot \frac{y^{12}}{y} = 2 \cdot 1 \cdot y^{11} = 2y^{11}$	<p>40. <math>\frac{(3ab^3)^2}{3ab^6}</math></p>
<p>41. <math>2^0 = 1</math></p>	<p>42. <math>5^0</math></p>
<p>43. <math>(x^4)^0 = 1</math></p>	<p>44. <math>(y^5)^0</math></p>
<p>45. <math>x^0 - 3^0 = 1 - 1 = 0</math></p>	<p>46. <math>y^0 + 4^0</math></p>
<p>47. Find and simplify an expression for the area of the rectangle below.</p>  <p>Area = <math>5x^3 \cdot 2x^2 = 10x^5</math></p>	<p>48. A piece of rope <math>10x^4</math> feet long is divided into equal length sections that are each <math>5x^2</math> feet long. Find and simplify an expression for the number of sections of rope obtained.</p> 
<p>Answers: 37. <math>48a^9b^{14}</math>; 39. <math>2y^{11}</math>; 41. 1; 43. 1; 45. 0; 47. <math>10x^5</math></p>	