**Exponent rules worksheet**

Simplify and evaluate when possible.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>1. $8^3 \times 8^4 = $</td>
<td>13. $(4^2e^2f^0)^9 = $</td>
<td>25. $(f^2g^3)^4(g^3)^4 = $</td>
</tr>
<tr>
<td>2. $z^{15} \div z^9 = $</td>
<td>14. $2^2x = $</td>
<td>26. $(k^4m/k^2km^3)^3 = $</td>
</tr>
<tr>
<td>3. $(x^4)^5 = $</td>
<td>15. $4x^2 \times 2x^3 = $</td>
<td>27. $x^2y^3z^6/x^2y^3z^6 = $</td>
</tr>
<tr>
<td>4. $(de^2)^7 = $</td>
<td>16. $12x^4/3x^2 = $</td>
<td>28. $d^2/d^9 = $</td>
</tr>
<tr>
<td>5. $(b^8/c^3)^3 = $</td>
<td>17. $-(2^3)^3 = $</td>
<td>29. $2f(7f^6) = $</td>
</tr>
<tr>
<td>6. $(x^9)^0 = $</td>
<td>18. $(3^3y^4z^2)^2 = $</td>
<td>30. $36i^2/j^2/6i^3j^2 = $</td>
</tr>
<tr>
<td>7. $g^5 = $</td>
<td>19. $(16f^5g^2/2f^2g^2)^3 = $</td>
<td>31. $(3^3)^2 = $</td>
</tr>
<tr>
<td>8. $y^4 \times y \times y^3 = $</td>
<td>20. $c^7/c^7 = $</td>
<td>32. $(4x^2y)(2^2xy^2)^2 = $</td>
</tr>
<tr>
<td>9. $6^2 \div 6^5 = $</td>
<td>21. $6k^3/k^4 = $</td>
<td>33. $(9i^5/3i^2)^2 = $</td>
</tr>
<tr>
<td>10. $(4^2)^3 = $</td>
<td>22. $(6a^2)(3a^3) = $</td>
<td>34. $[(25a^2b^4c^5/5b^4c^4)-2(7c^4d^6)^2]^0 = $</td>
</tr>
<tr>
<td>11. $(5k^6)^3 = $</td>
<td>23. $5c^4/25c = $</td>
<td>35. $20e^2f^5g^7/5e^4fg^3 = $</td>
</tr>
<tr>
<td>12. $(3r^2/5s^4)^2 = $</td>
<td>24. $(y^3)^2 = $</td>
<td></td>
</tr>
</tbody>
</table>

36. The objective lens of a microscope can magnify an object 103 times, and the eyepiece can further magnify an object 102 times. What is the maximum magnification on the microscope?

37. There are $4 \times 10^{13}$ cells in the average person. There are $7 \times 10^9$ people in the world. How many cells do all humans have together? Express the answer as a power.
### Answer Key

<p>| | | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>1. 2,097,152</td>
<td>13. 1</td>
<td>25. (f^6g^28)</td>
</tr>
<tr>
<td>2. (z^6)</td>
<td>14. (x/4)</td>
<td>26. (k^6/m^6)</td>
</tr>
<tr>
<td>3. (x^{20})</td>
<td>15. (8x^5)</td>
<td>27. 1</td>
</tr>
<tr>
<td>4. (d^7e^{14})</td>
<td>16. (4x^3)</td>
<td>28. (d^7)</td>
</tr>
<tr>
<td>5. (b^{24}/c^9)</td>
<td>17. (-512)</td>
<td>29. (14f^7)</td>
</tr>
<tr>
<td>6. 1</td>
<td>18. (81y^{30}z^8)</td>
<td>30. (6j^3/i^3)</td>
</tr>
<tr>
<td>7. (1/g^5)</td>
<td>19. (512f^3g^8)</td>
<td>31. (1/729)</td>
</tr>
<tr>
<td>8. (y^8)</td>
<td>20. 1</td>
<td>32. (2,048x^{10}y^8)</td>
</tr>
<tr>
<td>9. 36</td>
<td>21. (6k^7)</td>
<td>33. (9j^9/i^4)</td>
</tr>
<tr>
<td>10. 4,096</td>
<td>22. (18\alpha^5)</td>
<td>34. 1</td>
</tr>
<tr>
<td>11. 125k^{18}</td>
<td>23. (c^3/5)</td>
<td>35. (4e^6g^2/f^6)</td>
</tr>
<tr>
<td>12. (9r^4/25s^3)</td>
<td>24. (1/y^8)</td>
<td></td>
</tr>
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</table>

36. \(28 \times 10^{22}\)

37. \(10^5\)