Rational exponents: harder worksheet – Grade 10

Grade 10 · Mixed level · 20 questions · **Version X2885**

Name: _____ Date: _____ Score: ___ / 20

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1. Evaluate $27^{-\frac{1}{3}}$. Write it as a fraction.

   Answer: _____

2. Write $\sqrt[3]{x^3}$ with a rational exponent.

   A. x^{9} **B.** $x^{\frac{3}{3}}$ **C.** x^{6}

3. Work out $81^{\frac{3}{4}}$.

   Answer: _____

4. Find the value of $8^{-\frac{1}{3}}$. Write it as a fraction.

   Answer: _____

5. Simplify: $x^{\frac{5}{12}} \times x^{\frac{6}{12}}$.

   A. $x^{\frac{11}{12}}$ **B.** $x^{\frac{30}{12}}$ **C.** $x^{\frac{11}{24}}$ **D.** $2x^{\frac{11}{12}}$

6. Work out $125^{-\frac{1}{3}}$. Write it as a fraction.

   Answer: _____

7. Evaluate $125^{\frac{2}{3}} + 25^{\frac{1}{2}}$.

   Answer: _____

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8. Solve for x: $x^{\frac{2}{3}} = 4$. Give the positive answer.

   Answer: _____

9. Using $A = 6V^{\frac{2}{3}}$, what is the surface area of a cube with volume 27 cm³, in cm²?

   Answer: _____ cm²

10. Write $\frac{x^{\frac{1}{3}}}{x^{-\frac{1}{3}}}$ in simplest form.

    A. $x^{-\frac{1}{3}}$ **B.** $x^{\frac{2}{3}}$ **C.** $x^{\frac{1}{4}}$ **D.** $x^{\frac{0}{3}}$

11. Using $s = V^{\frac{1}{3}}$, what is the edge of a cubic tank with a volume of 343 m³, in metres?

    Answer: _____ m

12. Solve: $x^{\frac{2}{3}} = 9$. Give the positive answer.

    Answer: _____

13. Solve for x: $x^{\frac{1}{3}} = 4$

    Answer: _____

14. Solve: $x^{\frac{1}{3}} = 3$

    Answer: _____

15. Solve for x: $2x^{\frac{1}{2}} + 2 = 12$

    Answer: _____

16. An animal's energy use is $E = 70M^{\frac{3}{4}}$, with M in kg. What is E for a 16 kg animal?

    Answer: _____

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17. A 300 dollar investment doubles every 3 years. What is it worth after 6 years, in dollars?

    Answer: $_____

18. An investment of 200 dollars grows to 800 dollars over 2 periods. What single factor is it multiplied by each period?

    Answer: _____

19. Solve: $5x^{\frac{1}{2}} + 3 = 23$

    Answer: _____

20. An animal's energy use is $E = 70M^{\frac{3}{4}}$, with M in kg. What is E for a 4096 kg animal?

    Answer: _____

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Answer key · Version X2885

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1. **1/3**
2. **B ($x^{\frac{3}{3}}$)**
3. **27**
4. **1/2**
5. **A ($x^{\frac{11}{12}}$)**
6. **1/5**
7. **30**
8. **8**
9. **54**
10. **B ($x^{\frac{2}{3}}$)**
11. **7**
12. **27**
13. **64**
14. **27**
15. **25**
16. **560**
17. **1200**
18. **2**
19. **16**
20. **35840**

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