Name: _____ Date: _____

BLM 6–6

Section 6.2 Rational Exponents

1. Evaluate.

a) $\sqrt{169}$ **b)** $\sqrt[4]{625}$

c) $\sqrt[3]{64}$ **d)** $\sqrt[8]{256}$

2. Evaluate, if possible. If not possible, explain why.

a) $-\sqrt{36}$ **b)** $\sqrt[5]{-100\,000}$

c) $\sqrt[3]{-216}$ **d)** $\sqrt[4]{-16}$

3. Use a calculator. Evaluate to three decimal places.

a) $\sqrt[4]{68}$ **b)** $\sqrt[5]{-1200}$

c) $\sqrt[3]{94}$ **d)** $\sqrt[3]{32}$

4. Write in radical form. Then, evaluate.

a) $256^{\frac{1}{4}}$ **b)** $10\,000^{\frac{1}{4}}$

c) $128^{\frac{1}{7}}$ **d)** $\left(\frac{1}{27}\right)^{\frac{1}{3}}$

5. Evaluate, if possible. If not possible, explain why.

a) $(-1)^{\frac{1}{3}}$ **b)** $(-125)^{\frac{1}{3}}$

c) $(-81)^{\frac{1}{4}}$ **d)** $64^{\frac{1}{2}}$

6. Evaluate.

a) $64^{\frac{3}{2}}$ **b)** $100^{\frac{5}{2}}$

c) $16^{\frac{3}{4}}$ **d)** $(81)^{\frac{5}{4}}$

7. Evaluate, if possible. If not possible, explain why.

a) $(-8)^{\frac{2}{3}}$ **b)** $625^{\frac{3}{4}}$

c) $(-256)^{\frac{5}{4}}$ **d)** $\left(\frac{4}{49}\right)^{\frac{3}{2}}$

8. Evaluate. Round your answer to three decimal places.

a) $90^{\frac{1}{3}}$ **b)** $36.8^{\frac{1}{4}}$

c) $\sqrt[5]{165}$ **d)** $42^{\frac{2}{3}}$

e) $(-0.45)^{\frac{2}{5}}$ **f)** $2.37^{\frac{5}{6}}$

9. Evaluate, if possible. If not possible, explain why. Round decimal answers to three decimal places.

a) $(-10\,000)^{\frac{1}{2}}$ **b)** $(-10\,000)^{\frac{1}{3}}$

c) $(-10\,000)^{\frac{1}{4}}$ **d)** $(-10\,000)^{\frac{1}{5}}$

10. Refer to your answers to questions 2, 5, 7, and 9. How do you know if a power with a negative base can be evaluated? Use examples to explain.

11. The predicted cost, C, in dollars, of consumer goods at some future time is given by $C = c(1+r)^{\frac{n}{12}}$, where c is the current cost, in dollars; r is the inflation rate as a decimal; and n is the number of months. (Hint: $\frac{n}{12}$ is the number of years.)

The current cost of certain goods is \$32 and the inflation rate is 4%.

a) Determine the cost of these goods after eight months.

b) Determine the cost of these goods after 20 months.

c) Rewrite the equation to express r in terms of C and c.

12. Simplify $\sqrt{a^8b^6}\sqrt{25a^4}\sqrt{81b^2}$.

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