

**Math 10C**  
**Roots and Powers**  
**Fractional Exponents and Radicals**

Name: \_\_\_\_\_

Date: \_\_\_\_\_

1. Evaluate each power without using a calculator.

a)  $16^{\frac{1}{2}}$

b)  $36^{\frac{1}{2}}$

c)  $64^{\frac{1}{3}}$

d)  $(-27)^{\frac{1}{3}}$

2. Write each power as a radical.

a)  $36^{\frac{1}{3}}$

b)  $48^{\frac{1}{2}}$

c)  $(-10)^{\frac{3}{5}}$

d)  $4^{\frac{2}{3}}$

3. Write each radical as a power.

a)  $\sqrt{39}$

b)  $\sqrt[3]{29}$

c)  $\sqrt[4]{90}$

d)  $\sqrt[5]{2^3}$

4. Evaluate each power without using a calculator.

a)  $9^{\frac{3}{2}}$

b)  $(\frac{27}{8})^{\frac{2}{3}}$

c)  $(-27)^{\frac{2}{3}}$

d)  $(\frac{4}{25})^{\frac{3}{2}}$



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1. Evaluate each power without using a calculator.

a)  $16^{\frac{1}{2}}$   
 $(\sqrt[2]{16})^1$   
 $\boxed{4}$

b)  $36^{\frac{1}{2}}$   
 $(\sqrt[2]{36})^1$   
 $\boxed{6}$

c)  $64^{\frac{1}{3}}$   
 $(\sqrt[3]{64})^1$   
 $\boxed{4}$

d)  $(-27)^{\frac{1}{3}}$   
 $(\sqrt[3]{-27})^1$   
 $\boxed{-3}$

2. Write each power as a radical.

a)  $36^{\frac{1}{3}}$   
 $(\sqrt[3]{36})^1$

b)  $48^{\frac{1}{2}}$   
 $(\sqrt[2]{48})^1$

c)  $(-10)^{\frac{3}{5}}$   
 $(\sqrt[5]{-10})^3$

d)  $4^{\frac{2}{3}}$   
 $(\sqrt[3]{4})^2$

3. Write each radical as a power.

a)  $(\sqrt{39})^1$   
 $39^{\frac{1}{2}}$

b)  $\sqrt[3]{29}^1$   
 $29^{\frac{1}{3}}$

c)  $\sqrt[4]{90}^1$   
 $90^{\frac{1}{4}}$

d)  $\sqrt[5]{2^3}$   
 $2^{\frac{3}{5}}$

4. Evaluate each power without using a calculator.

a)  $9^{\frac{3}{2}}$   
 $(\sqrt{9})^3$   
 $(3)^3$   
 $\boxed{27}$

b)  $(\frac{27}{8})^{\frac{2}{3}}$   
 $(\sqrt[3]{\frac{27}{8}})^2$   
 $(\sqrt[3]{\frac{3}{8}})^2$   
 $(\frac{3}{2})^2$   
 $\boxed{\frac{9}{4}}$

c)  $(-27)^{\frac{2}{3}}$   
 $(\sqrt[3]{-27})^2$   
 $(-3)^2$   
 $\boxed{9}$

d)  $(\frac{4}{25})^{\frac{3}{2}}$   
 $(\sqrt{\frac{4}{25}})^3$   
 $(\frac{2}{5})^3$   
 $\boxed{\frac{8}{125}}$

