

Math 10C
Radicals

Name: KEY

1. Simplify the following radicals .

a. $\sqrt{49}$
7

b. $\sqrt{12}$
 $\sqrt{4 \times 3}$
 $2\sqrt{3}$

c. $2\sqrt{32}$
 $2 \times \sqrt{16} \times \sqrt{2}$
 $2 \times 4 \times \sqrt{2}$
 $8\sqrt{2}$

d. $\sqrt[3]{81}$
 $\sqrt[3]{27} \times \sqrt[3]{3}$
 $3\sqrt[3]{3}$

e. $-4\sqrt{28}$
 $-4\sqrt{4} \times \sqrt{7}$
 $-4 \times 2 \times \sqrt{7}$
 $-8\sqrt{7}$

f. $5\sqrt{48}$
 $5 \times \sqrt{16} \times \sqrt{3}$
 $5 \times 4 \times \sqrt{3}$
 $20\sqrt{3}$

g. $\sqrt{162}$
 $\sqrt{81} \times \sqrt{2}$
 $9\sqrt{2}$

h. $\sqrt[3]{54}$
 $\sqrt[3]{27} \times \sqrt[3]{2}$
 $3\sqrt[3]{2}$

2. Turn the following radicals into entire radicals.

a. $2\sqrt{6}$
 $\sqrt{6 \times 2 \times 2}$
 $\sqrt{24}$

b. $5\sqrt{3}$
 $\sqrt{3 \times 5 \times 5}$
 $\sqrt{75}$

c. $-3\sqrt[3]{2}$
 $\sqrt[3]{2 \times (-3)^3}$
 $\sqrt[3]{-54}$

d. $4\sqrt[3]{5}$
 $\sqrt[3]{5 \times (4)^3}$
 $\sqrt[3]{320}$

3. Rewrite the following with rational exponents.

a. $\sqrt[2]{16^3}$
 $16^{\frac{3}{2}}$

b. $\sqrt[3]{25^4}$
 $25^{\frac{4}{3}}$

4. Rewrite the following as a radical

a. $5^{\frac{3}{2}}$

$$\left(2\sqrt{5}\right)^3$$

b. $\left(\frac{125}{8}\right)^{-\frac{2}{3}}$ $\left(\frac{8}{125}\right)^{\frac{2}{3}}$

$$3\sqrt{\frac{8}{125}}^2$$

5. Evaluate the following, show all the steps and leave the answer as an exact value.

a. $(-64)^{\frac{2}{3}}$

$$\left(3\sqrt{-64}\right)^2$$

$$(-4)^2$$

$$\boxed{16}$$

b. $\left(\frac{49}{16}\right)^{\frac{1}{2}}$

$$\left(\frac{16}{49}\right)^{\frac{1}{2}}$$

$$\left(\sqrt{16}\right)^1 = \boxed{\frac{4}{7}}$$

c. $(-8)^{\frac{2}{3}}$

$$\left(3\sqrt{-8}\right)^2$$

$$(-2)^2$$

$$\boxed{4}$$

d. $\left(\frac{81}{25}\right)^{\frac{1}{2}}$

$$\left(\sqrt{81}\right)^1$$

$$\left(\sqrt{25}\right)^1$$

$$\boxed{\frac{9}{5}}$$

e. $\left(\frac{64}{27}\right)^{\frac{2}{3}}$

$$\left(\frac{27}{64}\right)^{\frac{2}{3}}$$

$$\left(\sqrt[3]{27}\right)^2 = \frac{(3)^2}{(4)^2} = \boxed{\frac{9}{16}}$$