Honors Pre-Calculus Name Key

Evaluating with Negative and Rational Exponents

Power / Root

Write each expression in radical form.

1) $b^{\frac{8}{5}}$

$(\sqrt[5]{b})^8$

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

$(\sqrt[3]{a})^2$

3) $m^{\frac{4}{5}}$

$(\sqrt[5]{m})^4$

4) $(7b)^{\frac{5}{3}}$

$(\sqrt[3]{7b})^5$

Write each expression in exponential form.

5) $(\sqrt{x})^5$

$x^{\frac{5}{2}}$

6) $(\sqrt[3]{r})^4$

$r^{\frac{4}{3}}$

7) $(\sqrt[4]{10n})^5$

$(10n)^{\frac{5}{4}}$

8) $(\sqrt[5]{10n})^6$

$(10n)^{\frac{6}{5}}$

Simplify.

9) $36^{\frac{3}{2}}$ $(\sqrt{36})^3 = 6^3$

216 ✓

10) $64^{\frac{1}{3}}$ $\sqrt[3]{64}$

4

11) $9^{\frac{1}{2}}$ $\sqrt{9}$

3

12) $81^{\frac{1}{2}}$ $\sqrt{81}$

9

13) $64^{\frac{3}{2}}$ $(\sqrt{64})^3 = (8)^3$

512

14) $64^{\frac{1}{2}}$ $\sqrt{64}$

8

15) $8^{\frac{5}{3}}$ $(\sqrt[3]{8})^5 = (2)^5$

32

16) $81^{\frac{3}{2}}$ $(\sqrt{81})^3 = (9)^3$

729

17) $100^{\frac{3}{2}}$ $(\sqrt{100})^3 = 10^3$

1000

18) $343^{\frac{2}{3}}$ $(\sqrt[3]{343})^2 = (7)^2$

49

19) $81^{\frac{3}{4}}$ $(\sqrt[4]{81})^3 = (3)^3$

27

20) $36^{\frac{1}{2}}$ $\sqrt{36}$

6

* Negative exponents FLIP!

21) $81^{-\frac{1}{2}}$ $(\sqrt{81})^{-1} = (9)^{-1}$

$\frac{1}{9}$

22) $64^{-\frac{3}{2}}$ $(\sqrt{64})^{-3} = (8)^{-3}$

$\frac{1}{512}$

23) $\left(\frac{25}{16}\right)^{-\frac{3}{2}} = \left(\sqrt{\frac{25}{16}}\right)^{-3} = \left(\frac{5}{4}\right)^{-3}$

$\frac{64}{125}$

24) $16^{-\frac{3}{4}}$ $(\sqrt[4]{16})^{-3} = (2)^{-3}$

$\frac{1}{8}$

25) $64^{-\frac{1}{2}}$ $(\sqrt{64})^{-1} = (8)^{-1}$

$\frac{1}{8}$

26) $\left(\frac{8}{27}\right)^{\frac{2}{3}}$ $\left(\sqrt[3]{\frac{8}{27}}\right)^2 = \left(\frac{2}{3}\right)^2$

$\frac{4}{9}$