

BE-Alg.2 WEDNESDAY 10-20-10

ACT
2009
2010
practice
TEST

① JANELLE cut a board 30 feet long into 2 pieces. The ratio of the lengths of the 2 pieces is 2:3. What is the length, to the nearest foot, of the shorter piece?

- Ⓐ 5 Ⓑ 6 Ⓒ 12 Ⓓ 15 Ⓔ 18

② WHAT VALUES OF X ARE SOLUTIONS FOR $X^2 + 2X = 8$?

- Ⓐ -4, 2 Ⓑ -2, 0 Ⓒ -2, 4 Ⓓ 0, 2 Ⓔ 6, 8

ANS

① $S + L = 30$ EBS $\Rightarrow \frac{2}{2}S + \frac{3}{2}S = 30$
 $\frac{S}{L} = \frac{2}{3} \therefore L = \frac{3}{2}S$ $\frac{5}{2}S = 30$

$$S = 30 \cdot \frac{2}{5}$$

$S = 12$ ANS = Ⓒ

② $X^2 + 2X - 8 = 0$

$S \Rightarrow 2$

$P \Rightarrow -8$

$-2 + 4$

$(X-2)(X+4) = 0$

$X = \{2, -4\}$ ANS = Ⓐ

Homework Review - Pg. 248 # 29-45 odd:

Homework review - Pg. 254 #15-25 odd

$$(15) \sqrt{243}$$

$$= \sqrt{3^4 \cdot 3}$$

$$= \sqrt{81 \cdot 3}$$

$$= \boxed{9\sqrt{3}}$$

$$\begin{array}{c} 243 \\ \swarrow \searrow \\ \textcircled{3} \quad 81 \\ \swarrow \searrow \quad \swarrow \searrow \\ \textcircled{9} \quad \textcircled{9} \\ \swarrow \searrow \quad \swarrow \searrow \quad \swarrow \searrow \\ \textcircled{3} \quad \textcircled{3} \quad \textcircled{3} \quad \textcircled{3} \end{array}$$

$$(17) \sqrt[3]{54}$$

$$= \sqrt[3]{27} \sqrt[3]{2}$$

$$= \boxed{3\sqrt[3]{2}}$$

$$\begin{array}{c} 54 \\ \swarrow \searrow \\ 6 \quad 9 \\ \swarrow \searrow \quad \swarrow \searrow \\ \textcircled{2} \quad \textcircled{3} \quad \textcircled{3} \quad \textcircled{3} \end{array}$$

$$(19) \sqrt{50x^4} = \sqrt{25} \sqrt{2} \sqrt{x^4} = \boxed{5x^2\sqrt{2}}$$

$$(21) \sqrt{18x^2y^3} = \sqrt{9} \sqrt{2} \sqrt{x^2} \sqrt{y^2} \sqrt{y}$$

$$\begin{array}{c} E100 \\ \downarrow \\ \boxed{3|x|y\sqrt{2y}} \end{array}$$

y is originally
part of y^3

WHICH, for this problem, must be positive

$$(23) \sqrt[3]{56y^6z^3} \Rightarrow 3 \cdot 2 y^2 z \sqrt[3]{7} = \boxed{6y^2z\sqrt[3]{7}}$$

$$= \sqrt[3]{8 \cdot 7 \cdot y^4 y^2 z^2 z}$$

$$\begin{array}{c} 56 \\ \swarrow \searrow \\ \textcircled{7} \quad \textcircled{8} \\ \swarrow \searrow \quad \swarrow \searrow \\ \textcircled{2} \quad \textcircled{4} \\ \swarrow \searrow \quad \swarrow \searrow \\ \textcircled{2} \quad \textcircled{2} \end{array}$$

$$\begin{array}{c} \uparrow \\ \sqrt[3]{8} \end{array}$$

$$(25) \sqrt[4]{\frac{1}{81}c^5d^4} = \frac{\sqrt[4]{1} \sqrt[4]{c^4 \cdot c} \sqrt[4]{d^4}}{\sqrt[4]{81}}$$

$$= \left(\frac{1}{3}\right)(c)(d)\sqrt{c} = \boxed{\frac{c|d|\sqrt{c}}{3}}$$

Ch. 5-7 RATIONAL (Fractional) Exponents

FER $a^{\frac{N}{m}} = {}^m\sqrt{a^N}$

Fractional
Exponent
Rule

(EX) $4^{\frac{1}{2}} = {}^2\sqrt{4} = 2$

NOTE: $2 \cdot 2 = 4$

$4^{\frac{1}{2}} \cdot 4^{\frac{1}{2}} = 4^1 \checkmark$

(EX) $x^{\frac{3}{4}} = {}^4\sqrt{x^3}$

(EX) $x^{\frac{1}{2}} = {}^2\sqrt{x} = \sqrt{x}$

(EX) $x^{\frac{1}{3}} = {}^3\sqrt{x}$

(EX) $4^{\frac{3}{2}} = \sqrt{4^3} = \sqrt{64} = 8$

$= \sqrt{4 \cdot 4 \cdot 4}$

$= \sqrt{4} \sqrt{4} \sqrt{4}$

$= (\sqrt{4})^3 = \sqrt{4^3} \quad \therefore a^{\frac{N}{m}} = {}^m\sqrt{a^N}$

OR $({}^m\sqrt{a})^N$

EX 1
pg 257 $a^{\frac{1}{4}} = {}^4\sqrt{a}$

$x^{\frac{1}{5}} = {}^5\sqrt{x}$

EX 2
pg 258 ${}^3\sqrt{y} = y^{\frac{1}{3}}$

${}^8\sqrt{c} = c^{\frac{1}{8}}$

(EX) ${}^4\sqrt{x^3} = x^{\frac{3}{4}}$

Ex 3
Pg 253 (A) $16^{-\frac{1}{4}} = \frac{1}{16^{\frac{1}{4}}} = \frac{1}{\sqrt[4]{16}}$
 $= \boxed{\frac{1}{2}}$

OR
* NOTE - THE
ACT likes
these kind
of approaches

$$16^{-\frac{1}{4}} = (2^4)^{-\frac{1}{4}} = 2^{-1} = \frac{1}{2}$$

* ↑
power-to-power rule

(B) $243^{\frac{3}{5}} = (3^5)^{\frac{3}{5}} = 3^{\frac{15}{5}} = 3^3 = \boxed{27}$

OR $\sqrt[5]{243^3} = (\sqrt[5]{243})^3 = (3)^3 = \boxed{27}$

Simplify $\Rightarrow$ Also "rationalize the denominator"
which means NO fractional exponents
in denominator

(EX) $\frac{1}{x^{\frac{2}{3}}} \cdot \frac{x^{\frac{1}{3}}}{x^{\frac{1}{3}}} = \boxed{\frac{x^{\frac{1}{3}}}{x^1}}$

↑
ADD THE SMALLEST EXPONENT
possible to get an exponent
of 1. Remember, by the Mult.
Rule you ARE ADDING exponents.

Ex 5
Pg. 259

Simplify:

$$\textcircled{A} \quad x^{\frac{1}{5}} \cdot x^{\frac{7}{5}} = \boxed{x^{\frac{8}{5}}}$$

$$\textcircled{B} \quad y^{-\frac{3}{4}} = \frac{1}{y^{\frac{3}{4}}} \cdot \frac{y^{\frac{1}{4}}}{y^{\frac{1}{4}}} = \boxed{\frac{y^{\frac{1}{4}}}{y}}$$

Ex 6
Pg 260

$$\textcircled{A} \quad \frac{\sqrt[8]{81}}{\sqrt[6]{3}} = \frac{\sqrt[8]{3^4}}{\sqrt[6]{3^1}} = \frac{3^{\frac{4}{8}}}{3^{\frac{1}{6}}} = \frac{3^{\frac{1}{2}}}{3^{\frac{1}{6}}}$$

$$= \frac{3^{\frac{3}{6}}}{3^{\frac{1}{6}}} = 3^{\frac{3}{6} - \frac{1}{6}} = 3^{\frac{2}{6}} = 3^{\frac{1}{3}} = \boxed{\sqrt[3]{3}}$$

$$\textcircled{B} \quad \sqrt[4]{9z^2} = \sqrt[4]{3^2 z^2} = 3^{\frac{2}{4}} z^{\frac{2}{4}} = 3^{\frac{1}{2}} z^{\frac{1}{2}} = \boxed{\sqrt{3z}}$$

$$\textcircled{C} \quad \frac{m^{\frac{1}{2}} - 1}{m^{\frac{1}{2}} + 1} \cdot \frac{m^{\frac{1}{2}} - 1}{m^{\frac{1}{2}} - 1} = \frac{m - m^{\frac{1}{2}} - m^{\frac{1}{2}} + 1}{m - 1}$$

$$= \boxed{\frac{m - 2m^{\frac{1}{2}} + 1}{m - 1}}$$

$$\text{or} \quad \boxed{\frac{m - 2\sqrt{m} + 1}{m - 1}}$$

• Homework: Pg 261 # 21-53 odd