BE-Alg.2

Tuesday 10-25-11

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?

(A) 5 (B) 6 (C) 12 (D) 15 (E) 18

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② WHAT VALUES of x ARE SOLUTIONS for $x^2 + 2x = 8$?

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

ANS

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

$\frac{S}{L} = \frac{2}{3}$ $\therefore L = \frac{3}{2}S$

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

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

$\boxed{S = 12}$ ANS = (C)

② $x^2 + 2x - 8 = 0$

$S \Rightarrow 2$

$P \Rightarrow -8$

$-2 \quad +4$

$(x-2)(x+4) = 0$ $\therefore \boxed{x = \{2, -4\}}$ ANS = (A)

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

(29) $\pm\sqrt{169} = \boxed{\pm 13}$ Perfect square

(31) $\sqrt{(-18)^2} = \sqrt{(-1)^2(18)^2} = \sqrt{(1)(18)^2} = \boxed{18}$

Since $(-18)^2$ is always positive.

(33) $\sqrt[7]{-128} = \boxed{-2}$ Since $2\cdot2\cdot2\cdot2\cdot2\cdot2\cdot2$

$8 \cdot 8 \cdot 2$

$64 \cdot 2 = 128$

(35) $\sqrt[3]{\frac{1}{125}} = \frac{\sqrt[3]{1}}{\sqrt[3]{125}} = \boxed{\frac{1}{5}}$

(37) $\sqrt[3]{-0.064} = \frac{\sqrt[3]{-64}}{\sqrt[3]{1000}} = \frac{-4}{10} = \boxed{\frac{-2}{5}}$ or $\boxed{-0.4}$

(39) $-\sqrt[6]{x^6} = \boxed{-|x|}$ Since $\sqrt[6]{x^6} = x^1$ (6: even, 1: odd)

(41) $\sqrt{64a^8} = \boxed{8a^4}$

(43) $\sqrt[3]{-c^6} = \boxed{-c^2}$ Since $(-c^2)(-c^2)(-c^2) = -c^6$

(45) $\sqrt[3]{(2z)^6} = (2z)^2 = \boxed{4z^2}$

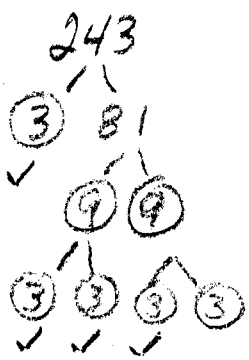
Homework review – Pg. 254 #15–25 ODD

(15) $\sqrt{243}$

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

$= \sqrt{81 \cdot 3}$

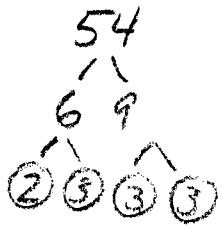
$= \boxed{9\sqrt{3}}$



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

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

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



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

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

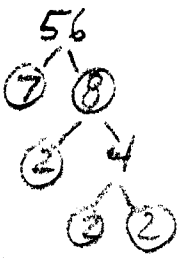
Ei00

$\boxed{3|x|y\sqrt{2y}}$

y is originally part of y^3 which, for this problem, must be positive

(23) $3\sqrt[3]{56y^6z^3}$

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



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

$\sqrt[3]{8}$

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

Ei00

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

Ch. 5-7 Rational (Fractional) Exponents

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

Fractional Exponent Rule

(Ex) $4^{\frac{1}{2}} = \sqrt[2]{4^1} = 2$

Note: $2 \cdot 2 = 4$

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

(Ex) $x^{\frac{3}{4}} = \sqrt[4]{x^3}$

(Ex) $x^{\frac{1}{2}} = \sqrt[2]{x} = \sqrt{x}$

(Ex) $x^{\frac{1}{3}} = \sqrt[3]{x}$

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

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

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

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

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

Ex 1 Pg 257 $a^{\frac{1}{4}} = \sqrt[4]{a}$

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

Ex 2 Pg 258 $\sqrt[3]{y} = y^{\frac{1}{3}}$

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

(Ex) $\sqrt[4]{x^3} = x^{\frac{3}{4}}$

Ex 3 PG 258 (A) $16^{-\frac{1}{4}} = \frac{1}{16^{\frac{1}{4}}} = \frac{1}{\sqrt[4]{16^1}}$

$= \boxed{\frac{1}{2}}$

OR

* NOTE – THE ACT likes these kind OF Approaches

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

(* : $16^{-\frac{1}{4}}$ and $(2^4)^{-\frac{1}{4}}$; ↑ power-to-power rule)

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

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

Simplify ⇒ 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:

(A) $x^{\frac{1}{5}} \cdot x^{\frac{7}{5}} = \boxed{x^{\frac{8}{5}}}$

(B) $y^{-\frac{3}{4}} = \frac{1}{y^{\frac{3}{4}}} \cdot \frac{y^{\frac{1}{4}}}{y^{\frac{1}{4}}} = \boxed{\frac{y^{\frac{1}{4}}}{y}}$

Ex 6 Pg 260 (A) $\frac{\sqrt[8]{81}}{\sqrt[6]{3}} = \frac{\sqrt[8]{3^4}}{\sqrt[6]{3^1}} = \frac{3^{\frac{4}{8}}}{3^{\frac{1}{6}}} = \frac{3^{\frac{1}{2}}}{3^{\frac{1}{6}}}$

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

(B.) $\sqrt[4]{9z^2} = \sqrt[4]{3^2 z^2} = 3^{\frac{2}{4}} z^{\frac{2}{4}} = 3^{\frac{1}{2}} z^{\frac{1}{2}}$

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

(C.) $\frac{m^{\frac{1}{2}}-1}{m^{\frac{1}{2}}+1} \cdot \frac{m^{\frac{1}{2}}-1}{m^{\frac{1}{2}}-1} = \frac{m - m^{\frac{1}{2}} - m^{\frac{1}{2}} + 1}{m-1}$

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

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

- Homework: Pg 261 # 21–53 ODD