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FOM 10 – Chapter 1 PRACTICE Test*** /26

Each question is written response (except #2). **Show all of your work.**

1) Are the following statements **true** of **false**: *(0.5 marks each)*

a) All natural numbers are integers: T

b) All rational numbers are whole numbers: F — 0.7 is rational, but NOT whole!

2) To which set of numbers does $\sqrt[3]{-64}$ belong? (**circle BEST answer** for *1 mark*)

$= -4$

(a) Integer and Rational — yes = yes b) ~~Irrational~~ c) ~~Whole, Integer, and Rational~~ d) Rational — yes

3) Find the Greatest Common Factor (GCF) and Least Common Multiple (LCM) of the following numbers: 36 and 28

$36 = 2 \cdot 2 \cdot 3 \cdot 3$ $\quad 28 = 2 \cdot 2 \cdot 7$

$36 = 2^2 \cdot 3^2$ $\quad 28 = 2^2 \cdot 7$

GCF: $2 \cdot 2 = 4$ *(1 mark)* — GCF = 4

LCM: $2^2 \cdot 3^2 \cdot 7 = 4 \cdot 9 \cdot 7$ *(1mark)*

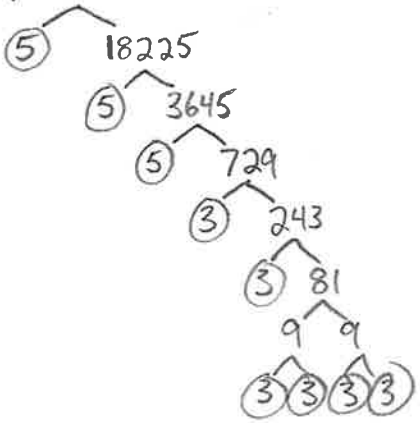
LCM = 252

4) Determine the following CUBE ROOT using the **grouping method:** *(2 marks)*

*(*marks ONLY if the **grouping method** shown)*

$\sqrt[3]{91125}$

*** use Calculator to help factor!*



$91125 = 3 \cdot 3 \cdot 3 \cdot 3 \cdot 3 \cdot 3 \cdot 5 \cdot 5 \cdot 5$ ← attempt to make 3 identical groups, since index is 3!

$91125 = (3 \cdot 3 \cdot 5)(3 \cdot 3 \cdot 5)(3 \cdot 3 \cdot 5)$

$91125 = (45)(45)(45)$

so...

$\sqrt[3]{91125} =$ 45

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5) Write each radical in SIMPLEST Form, as a mixed radical: *(1 mark each)*

a) $\sqrt{63}$

$= \sqrt{9 \times 7}$

$= \sqrt{9} \times \sqrt{7}$

$= 3\sqrt{7}$

b) $\sqrt[3]{40} = \sqrt[3]{8 \times 5}$

$= \sqrt[3]{8} \times \sqrt[3]{5}$

$= 2\sqrt[3]{5}$

c) $\sqrt{200}$

$= \sqrt{100 \times 2}$

$= \sqrt{100} \times \sqrt{2}$

$= 10\sqrt{2}$

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

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

$= 3 \cdot 3 \cdot \sqrt[3]{3}$

$= 9\sqrt[3]{3}$

6) Write each radical as an ENTIRE radical: *(1 mark each)*

a) $5\sqrt{5} = \sqrt{25}\sqrt{5}$

$= \sqrt{25 \times 5}$

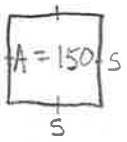
$= \sqrt{125}$

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

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

$= \sqrt[3]{54}$

7) A square has an area of $150 cm^2$. Find the side length as a radical in simplest form. *(1 mark)*



$A = s \times s$

$150 = s^2$

$s^2 = 150$

$s = \sqrt{150}$

$s = \sqrt{25 \times 6} = \sqrt{25} \times \sqrt{6} = 5\sqrt{6}$ cm

side length =

8) Write the following as a radical: *(1 mark)*

$x^{\frac{7}{4}} = \sqrt[4]{x^7}$ Flower power!

9) Write the following as a power (exponent form): *(1 mark)*

$(\sqrt[5]{2})^3 = 2^{\frac{3}{5}}$ Flower power!

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10) Evaluate the following: *(2 marks each)*

a) $2^{-5} = \frac{1}{2^5} = \boxed{\frac{1}{32}}$

b) $(-125)^{-\frac{1}{3}} = \frac{1}{(-125)^{\frac{1}{3}}} = \frac{1}{\sqrt[3]{-125}} = \frac{1}{-5}$

$\boxed{= -\frac{1}{5}}$

11) Simplify. Answer must only have positive exponents. *(2 marks each)*

a) $\frac{4p^7q^{-9}}{12pq^2}$

$= \frac{p^7}{3pq^2q^9}$

$\boxed{= \frac{p^6}{3q^{11}}}$

b) $\left(\frac{64x^2y^9}{4x^8y^{-4}}\right)^{-2}$

$= \left(\frac{16x^2y^9y^4}{x^8}\right)^{-2}$

$= \left(\frac{16y^{13}}{x^6}\right)^{-2}$

$= \left(\frac{x^6}{16y^{13}}\right)^2 = \boxed{\frac{x^{12}}{256y^{26}}}$

12) Simplify. Answer must only have positive exponents. *(3 marks)*

$\left(\frac{32x^7y^{-\frac{3}{4}}}{8x^{-7}y^{\frac{5}{4}}}\right)^{\frac{1}{2}} = \left(\frac{4x^7x^7}{y^{\frac{5}{4}}y^{\frac{3}{4}}}\right)^{\frac{1}{2}}$

$= \left(\frac{4x^{14}}{y^{\frac{8}{4}}}\right)^{\frac{1}{2}} = \left(\frac{4x^{14}}{y^2}\right)^{\frac{1}{2}} = \frac{4^{\frac{1}{2}}(x^{14})^{\frac{1}{2}}}{(y^2)^{\frac{1}{2}}} = \boxed{\frac{2x^7}{y}}$

Flower power: $\sqrt[2]{4^1}$

BONUS QUESTION ON THE BACK!

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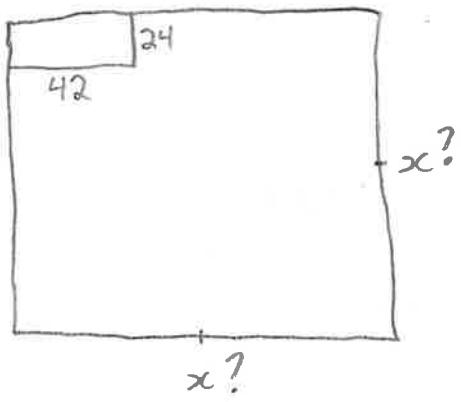
BONUS (for 1 BONUS mark)

What is the **side length** of the *smallest* **SQUARE WALL** that could be tiled with rectangular tiles that measure 24 cm by 42 cm, without cutting any of the tiles?



answer (x) will be bigger than #'s, so L.C.M.!

24 → 6, 4 → 2, 3, 2, 2

42 → 6, 7 → 2, 3

$24 = 2 \cdot 2 \cdot 2 \cdot 3$

$24 = 2^3 \cdot 3^1$

$42 = 2^1 \cdot 3^1 \cdot 7^1$

$LCM = 2^3 \cdot 3^1 \cdot 7^1$ ← highest power of any prime on either list!

$= 8 \cdot 3 \cdot 7$

$LCM = 168$

So, the side length of smallest square wall is 168cm