

FOM 10 – Chapter 2 Unit Test*

/24

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

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

a) All whole numbers are integers:

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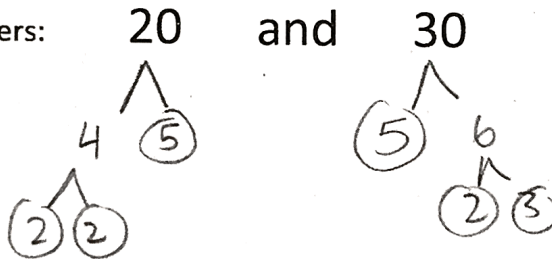
b) All rational numbers are integers:

F

2) To which set of numbers does $-\sqrt{36}$ belong? (circle **BEST** answer for 1 mark)

- a) Integer and Rational b) Irrational c) Natural, Integer, and Rational d) Rational

3) Find the Greatest Common Factor (GCF) and Least Common Multiple (LCM) of the following numbers: **20** and **30**



$20 = 2^2 \cdot 5$

$30 = 2 \cdot 3 \cdot 5$

GCF: $2 \cdot 5 = 10$ (1 mark)

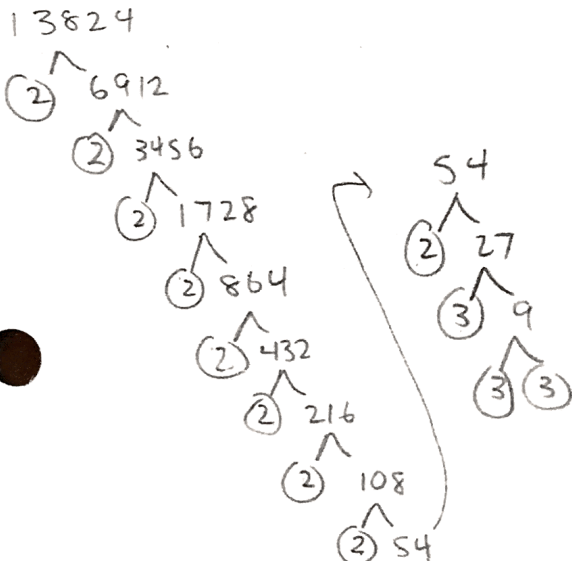
LCM: $2^2 \cdot 3 \cdot 5 = 60$ (1 mark)

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

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

** use Calculator to help factor!

$\sqrt[3]{13824}$



$(2 \cdot 2 \cdot 2 \cdot 3)(2 \cdot 2 \cdot 2 \cdot 3)(2 \cdot 2 \cdot 2 \cdot 2)$
 $(24)(24)(24)$

$\sqrt[3]{13824} = \underline{24}$

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

$$\begin{aligned} \text{a) } & \sqrt{48} \\ & = \sqrt{16 \cdot 3} \\ & = 4\sqrt{3} \end{aligned}$$

$$\begin{aligned} \text{b) } & \sqrt[3]{54} \\ & = \sqrt[3]{27 \cdot 2} \\ & = 3\sqrt[3]{2} \end{aligned}$$

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

$$\begin{aligned} \text{a) } & 3\sqrt{5} \\ & = \sqrt{9 \cdot 5} \\ & = \sqrt{45} \end{aligned}$$

$$\begin{aligned} \text{b) } & 4\sqrt[3]{2} \\ & = \sqrt[3]{64 \cdot 2} \\ & = \sqrt[3]{128} \end{aligned}$$

7) A square has an area of 108cm^2 . Find the side length as a radical in simplest form.

$$\begin{aligned} \text{(1 mark) } & A = 108 \\ & l \cdot w = 108 \\ & l^2 = 108 \\ & l = \sqrt{108} \end{aligned}$$

$$\begin{aligned} l & = \sqrt{36 \cdot 3} \\ & = \boxed{6\sqrt{3} \text{ cm}} \end{aligned}$$

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

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

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

$$(\sqrt[5]{2})^6 \quad 2^{\frac{6}{5}}$$

10) Evaluate the following: (2 marks each)

$$\begin{aligned} \text{a) } & 2^{-4} \\ & = \frac{1}{2^4} \\ & = \frac{1}{16} \end{aligned}$$

$$\begin{aligned} \text{b) } & (-27)^{-\frac{1}{3}} \\ & = \frac{1}{(-27)^{\frac{1}{3}}} \\ & = \frac{1}{\sqrt[3]{-27}} = \frac{1}{-3} = -\frac{1}{3} \end{aligned}$$

Name: _____

Date: _____

Block: _____

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

$$\text{a) } \frac{8p^5q^{-6}}{12pq^2}$$

$$\frac{2p^4q^{-8}}{3} = \boxed{\frac{2p^4}{3q^8}}$$

$$\text{b) } \left(\frac{16x^2y^9}{4x^{10}y^{-2}} \right)^{-2}$$

$$= (4x^{-8}y^{11})^{-2}$$

$$= \left(\frac{4y^{11}}{x^8} \right)^{-2} = \left(\frac{x^8}{4y^{11}} \right)^2 = \frac{x^{16}}{4^2 y^{22}} = \boxed{\frac{x^{16}}{16y^{22}}}$$

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

$$\left(\frac{9x^7y^{-7/4}}{3x^{-7}y^{9/4}} \right)^{1/2}$$

$$(9x^{14}y^{-16/4})^{1/2}$$

$$\left(\frac{9x^{14}}{y^4} \right)^{1/2} = \frac{9^{1/2}x^7}{y^2} = \frac{\sqrt{9}x^7}{y^2} = \boxed{\frac{3x^7}{y^2}}$$

BONUS QUESTION ON THE BACK!

Name: _____

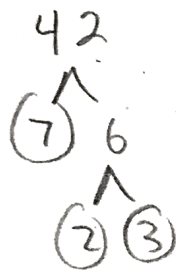
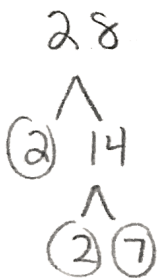
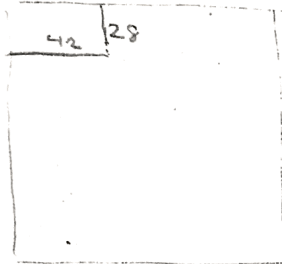
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BONUS (for 1 BONUS mark)

What is the side length of the largest SQUARE WALL that could be tiled with rectangular tiles that measure 28 cm by 42 cm, without cutting any of the tiles?

* LCM question



$$28 = 2^2 \cdot 7$$

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

$$\text{LCM} = 2^2 \cdot 3 \cdot 7$$

$$= 84 \text{ cm}$$

The side length of the wall is 84cm.