PMATH 11 - CHAPTER 1 - PRETEST   parent/guardian signature

Multiple Choice
CIRCLE the choice that best completes the statement or answers the question.

1. Identify the index of $\sqrt[3]{2^7}$.
   a. 2^7 (b.) 3   c. 7   d. 2

2. Which of these numbers is an integer, but not a whole number?
   $-9, 0, 1, \sqrt{5}$
   a. 0   (b.) -9 c. $\sqrt{5}$ d. 1

3. Write $\sqrt{108}$ in simplest form.
   a. $3\sqrt{12}$
   (b.) $6\sqrt{3}$
   c. $36\sqrt{3}$
   d. $3\sqrt{6}$

   108
   9×12
   $3,3 \cdot 2 \cdot 2 \cdot 3$
   $2 \cdot 3 \sqrt{3}$
   $6\sqrt{3}$

4. Write $6\sqrt{5}$ as an entire radical.
   a. $\sqrt{30}$
   b. $\sqrt{150}$
   (c.) $\sqrt{180}$
   d. $\sqrt{900}$

   $6 \times 6 \times 5$
   6×30
   180

5. Evaluate $64^{\frac{1}{3}}$.
   a. 8
   (b.) 4
   c. -4
   d. $21\frac{1}{3}$

   $3\sqrt{64}$

6. Evaluate 3^{-2}.
   a. $\sqrt{3}$
   b. $\frac{1}{6}$
   (c.) $\frac{1}{9}$
   d. 9

   $\frac{1}{3^2} = \frac{1}{9}$

7. Evaluate $(0.81)^{-\frac{3}{2}}$.

   a. $\dfrac{81}{100}$

   b. $\dfrac{729}{1000}$

   c. $\dfrac{100}{81}$

   d. $\dfrac{1000}{729}$ (circled)

(handwritten: $\left(\dfrac{81}{100}\right)^{-\frac{3}{2}} = \left(\dfrac{100}{81}\right)^{\frac{3}{2}} = \left(\dfrac{\sqrt{100}}{\sqrt{81}}\right)^{3} = \left(\dfrac{10}{9}\right)^{3} = \dfrac{1000}{729}$)

8. Evaluate $81^{-0.75}$.

   a. $\dfrac{4}{243}$

   b. $\dfrac{1}{27}$ (circled)

   c. 27

   d. $\dfrac{1}{81}$

(handwritten: $0.75 = \dfrac{3}{4}$; $81^{-\frac{3}{4}} = \dfrac{1}{81^{\frac{3}{4}}} = \dfrac{1}{(\sqrt[4]{81})^{3}} = \dfrac{1}{3^{3}}$)

9. Simplify $\dfrac{\left(3.5^{-6}\right)\left(3.5^{5}\right)}{3.5^{-1}}$ by writing as a single power.

   a. 3.5^{10}

   b. 3.5^{-29}

   c. 3.5^{0} (circled)

   d. 3.5^{-2}

(handwritten: $-6 + 5 - -1$; $-1 + 1 = 0$)

10. Write an equivalent form of 9 as a cube root.

    a. $\sqrt[3]{6561}$ b. $\sqrt[3]{729}$ (circled)   c. $\sqrt[3]{9\sqrt{81}}$ d. $\sqrt{81}$ (crossed out)

11. Which of these numbers is rational?

    $\sqrt{\dfrac{4}{169}},\ \sqrt{48},\ \sqrt[3]{-16},\ \sqrt{8.1}$

(handwritten: perfect square)

    a. $\sqrt{48}$ b. $\sqrt{8.1}$ c. $\sqrt[3]{-16}$ d. $\sqrt{\dfrac{4}{169}}$ (circled)

12. Write $\sqrt[4]{405}$ in simplest form.

    a. $3\sqrt[4]{5}$ (circled)

    b. $81\sqrt[4]{5}$

    c. $9\sqrt[4]{5}$

    d. $5\sqrt[4]{3}$

(handwritten: 405; 81, 5; $3 \cdot 3 \cdot 3 \cdot 3 \cdot 5$; $3\sqrt[4]{5}$)

2

13. A square has an area of 12 square inches. Determine the side length of the square as a radical in simplest form.

    a. $4\sqrt{3}$ in.

    b. $2\sqrt{6}$ in.

    c. $3\sqrt{2}$ in.

    d. $2\sqrt{3}$ in.

14. A cube has a volume of 7290 cm^3. Determine the edge length of the cube as a radical in simplest form.

    a. $9\sqrt[3]{90}$ cm

    b. $9\sqrt[3]{10}$ cm

    c. $81\sqrt[3]{10}$ cm

    d. $10\sqrt[3]{9}$ cm

15. Write $42^{\frac{5}{4}}$ as a radical.

    a. $\sqrt[5]{42^4}$

    b. $\left(\sqrt[4]{42}\right)^5$

    c. $\sqrt[5]{42}$

    d. $\left(\sqrt[5]{42}\right)^4$

16. Simplify $\dfrac{12p^3q^{-7}}{15pq^6}$. Write using powers with positive exponents.

    a. $\dfrac{4p^3}{5q^{13}}$

    b. $\sqrt{\dfrac{p^2}{3q^{13}}}$

    c. $\dfrac{4p^2}{5q}$

    d. $\dfrac{4p^2}{5q^{13}}$

17. Simplify $\left(\dfrac{36x^4y^3}{4x^8y^{-1}}\right)^{\frac{1}{2}}$.

    a. $3x^2y^2$

    b. $\dfrac{3y^2}{x^2}$

    c. $\dfrac{3y}{x^2}$

    d. $\dfrac{3y^2}{x^6}$

18. Simplify $\dfrac{\left(m^3 n^{-3}\right)^{-1}}{\left(m^{-2} n\right)^4}$.

$\dfrac{m^{-3}\, n^{3}}{m^{-8}\, m^{4}}$

$m^{-3-3}\quad m^{3-4}$

$m^{5}\, n^{-1}$

$\dfrac{m^5}{n}$

a. $\dfrac{m^5}{n^7}$

b. $\dfrac{m^5}{n}$

c. $\dfrac{m^{11}}{n}$

d. $\dfrac{m^{11}}{n^7}$

Problem - SHOW YOUR WORK

19. Order these numbers from **least to greatest**:

WORK

$\sqrt{38}$ 6.1644...
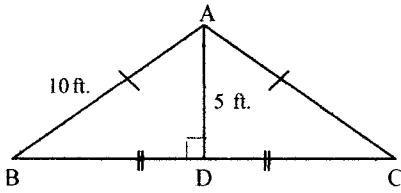
$\sqrt[3]{515}$ 8.01559...

$\dfrac{13}{3}$ 4.$\overline{3}$

$\sqrt{2}$ 1.4142...

$\sqrt[3]{128}$ 5.03968

final order $\sqrt{2}$ $\dfrac{13}{3}$ $\sqrt[3]{128}$ $\sqrt{38}$ $\sqrt[3]{515}$

4

20. In isosceles ΔABC, what is the length of BC? Write your answer as a mixed radical. Remember that PYTHAGOREAN theorem!!

$10^2 = 5^2 + BD^2$

$100 = 25 + BD^2$

$100 - 25 = BD^2$

$75 = BD^2$

$\sqrt{75} = BD$

$5\sqrt{3} = BD$

$\times 2$

$10\sqrt{3} = BC$

21. Here is a student's solution for evaluating a power. Prove if they are right or wrong by evaluating. Show all of your work.

$$\left(\frac{8}{27}\right)^{-\frac{2}{3}} = \frac{4}{9}$$

WORK

$\left(\frac{27}{8}\right)^{\frac{2}{3}} = \left(\frac{\sqrt[3]{27}}{\sqrt[3]{8}}\right)^2 = \frac{3}{2} , \frac{9}{4}$

They are incorrect

Is the student correct? (circle one)   YES or **NO**

5

22. A cone with equal height and radius has volume 492 cm³. What is the height of the cone to the nearest tenth of a centimetre? $(V = \frac{1}{3}\pi r^2 h)$

$h = r$

WORK

$$492 = \frac{1}{3}\pi h^2 h$$

$$492 = \frac{1}{3}\pi h^3$$

$$\times 3 \qquad \times 3$$

$$\frac{1476}{\pi} = \frac{\pi}{\pi} h^3$$

$$469.\ldots = h^3$$

ANSWER

$$\sqrt[3]{\quad} = h$$

$$7.8cm = h$$