Math 10C: Numbers, Radicals, and Exponents
PRACTICE EXAM

1. 1.273958... belongs to:

A. The set of integers.
B. The set of rationals.
C. The set of irrationals.
D. None of the above.

2. $7.\overline{4}$ belongs to:

A. The set of integers.
B. The set of rationals.
C. The set of irrationals.
D. None of the above.

3. $-\frac{2}{3}$ belongs to:

A. The natural number set.
B. The set of integers.
C. The set of rationals.
D. Both B and C.

4. $\sqrt{-2}$ belongs to:

A. The set of integers.
B. The set of rationals.
C. The set of irrationals.
D. None of the above.

5. Using a calculator, $\sqrt{8}$, $\sqrt[3]{-6}$, $-\sqrt{3}$, and $2\sqrt[3]{2}$ are ordered from least to greatest as:

A. $-\sqrt{3}$, $\sqrt[3]{-6}$, $2\sqrt[3]{2}$, $\sqrt{8}$
B. $-\sqrt{3}$, $\sqrt[3]{-6}$, $\sqrt{8}$, $2\sqrt[3]{2}$
C. $\sqrt[3]{-6}$, $-\sqrt{3}$, $2\sqrt[3]{2}$, $\sqrt{8}$
D. $\sqrt[3]{-6}$, $-\sqrt{3}$, $\sqrt{8}$, $2\sqrt[3]{2}$

6. A prime number is:

A. 0

B. 1

C. 13

D. Both B and C.

7. The least common multiple of 48 and 180 is:

A. 144

B. 180

C. 540

D. 720

8. The greatest common factor of 52 and 78 is:

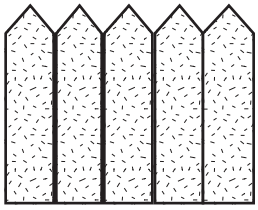
A. 4

B. 13

C. 26

D. 52

9. A fence is being constructed with posts that are 12 cm wide. A second fence is being constructed with posts that are 15 cm wide. If each fence is to be the same length, what is the shortest fence that can be constructed?



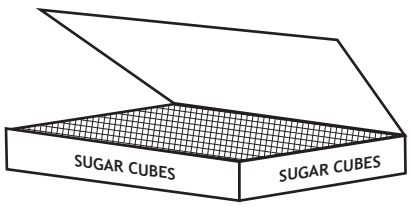
A. 30 cm

B. 60 cm

C. 90 cm

D. 120 cm

10. A box of sugar cubes has a length of 156 mm, a width of 104 mm, and a height of 39 mm. What is the edge length of one sugar cube? Assume the box is completely full and the manufacturer uses sugar cubes with the largest possible volume.



A. 2 mm

B. 3 mm

C. 13 mm

D. 39 mm

11. The expression $\dfrac{3\sqrt[3]{27}-(-4)^2}{-3^2-(-1)^2}$ is equal to:

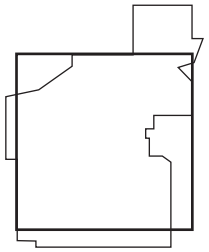
A. $-\dfrac{7}{8}$

B. $\dfrac{7}{8}$

C. $-\dfrac{7}{10}$

D. $\dfrac{7}{10}$

12. The area of Edmonton is 684 km^2. If the shape of Edmonton is approximated to be a square, how wide is the city?



A. 26.2 km

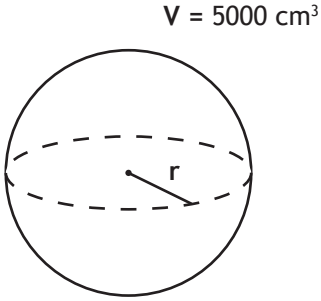
B. 30.0 km

C. 52.4 km

D. 342 km

13. The formula for the volume of a sphere is $V = \dfrac{4}{3}\pi r^3$.

If the volume of a sphere is approximately 5000 cm^3, what is the radius?



A. 10.6 cm

B. 34.5 cm

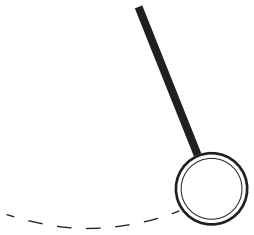
C. 50.0 cm

D. 524 cm

14. The amount of time, *T*, it takes for a pendulum to swing back and forth is called the period.

The period of a pendulum can be calculated with the formula: $T = 2\pi\sqrt{\dfrac{l}{9.8}}$

What is the length of the pendulum if the period is 2.4 s?



A. 1.2 m

B. 1.4 m

C. 3.1 cm

D. 12.7 cm

15. The index of $\sqrt{5}$ is:

A. 1
B. 2
C. 2.24
D. 5

16. $\sqrt{32}$, in its most reduced form, is equivalent to the mixed radical:

A. $4\sqrt{2}$
B. $4\sqrt{3}$
C. $2\sqrt{8}$
D. $2\sqrt{16}$

17. $\sqrt[3]{81}$, in its most reduced form, is equivalent to the mixed radical:

A. $2\sqrt[3]{3}$
B. $3\sqrt[3]{3}$
C. $2\sqrt[3]{9}$
D. $3\sqrt[3]{9}$

18. $2\sqrt[4]{3}$ is equivalent to the entire radical:

A. $\sqrt{24}$
B. $\sqrt{48}$
C. $\sqrt[4]{24}$
D. $\sqrt[4]{48}$

19. $\frac{3}{4}\sqrt{32}$, in its most reduced form, is equivalent to the mixed radical:

A. $2\sqrt{2}$
B. $3\sqrt{2}$
C. $3\sqrt{8}$
D. $3\sqrt{8}$

20. $\frac{3\sqrt[3]{72}}{\sqrt{64}}$, in its most reduced form, is equivalent to the mixed radical:

A. $\frac{3\sqrt[3]{8}}{8}$

B. $\frac{9\sqrt[3]{8}}{8}$

C. $\frac{5\sqrt[3]{9}}{8}$

D. $\frac{3\sqrt[3]{9}}{4}$

21. $\left(\frac{2}{3}\right)^{\frac{3}{2}}$ is equivalent to the radical:

A. $\left(\sqrt[3]{\frac{2}{3}}\right)^{2}$

B. $\left(\sqrt{\frac{2}{3}}\right)^{3}$

C. $\left(\sqrt[3]{\frac{3}{2}}\right)^{2}$

D. $\left(\sqrt{\frac{3}{2}}\right)^{3}$

22. $\left(\sqrt[3]{\frac{5}{7}}\right)^{2}$ is equivalent to the power:

A. $\left(\frac{2}{3}\right)^{\frac{5}{7}}$

B. $\left(\frac{7}{5}\right)^{\frac{2}{3}}$

C. $\left(\frac{5}{7}\right)^{\frac{2}{3}}$

D. $\left(\frac{5}{7}\right)^{\frac{3}{2}}$

23. $\left(\frac{2a^2}{b}\right)^3$ is equivalent to:

A. $\frac{2a^6}{b^3}$

B. $\frac{6a^6}{b^3}$

C. $\frac{8a^6}{b^3}$

D. $\frac{8a^8}{b}$

24. $\frac{(3ab)(2ab)^2}{2(ab)^3}$ simplifies to:

A. 1

B. $\frac{18}{ab}$

C. 3

D. 6

25. $\left(\frac{2a}{b}\right)^2 (ab)^0 \left(-\frac{1}{2}\right)^3$ expands to:

A. 1

B. $-\frac{2a^2}{b^2}$

C. $-\frac{a^2}{2b^2}$

D. $\frac{a^2}{2b^2}$

26. The value of *m* in the equation $\frac{a^m \times a^{2m}}{a} = a^{20}$ is:

A. 5

B. 7

C. 9

D. 11

27. $\left(\frac{3^{-1}}{5}\right)^{-2}$ simplifies to:

A. $\frac{9}{25}$

B. $\frac{25}{9}$

C. $\frac{1}{225}$

D. 225

28. $\left(\frac{a^{-4}}{(ab)^2}\right)^{\frac{3}{2}}$ simplifies to:

A. $\frac{a^2}{b^3}$

B. $\sqrt{\frac{a^3}{b^6}}$

C. $\frac{1}{a^9 b^3}$

D. $\sqrt[3]{\frac{1}{b^2}}$

29. $\left(a^5\right)\left(a^{-\frac{1}{2}}\right)$ simplifies to:

A. $\left(\sqrt{a}\right)^9$

B. $\left(\sqrt[9]{a}\right)^2$

C. $a^{-\frac{2}{5}}$

D. $a^{-\frac{5}{2}}$

30. The expression $\frac{2^{-3}+2^{-4}}{2^{-5}}$ is equivalent to:

A. 2

B. 4

C. 6

D. 8

31. $\sqrt{\sqrt[3]{a}}$ simplifies to:

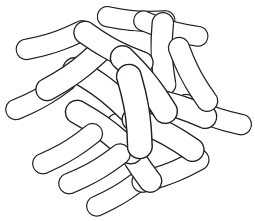
A. $a^{\frac{1}{6}}$

B. $a^{\frac{1}{5}}$

C. $a^{\frac{1}{4}}$

D. $a^{\frac{2}{3}}$

32. A culture of bacteria contains 5000 bacterium cells. This particular type of bacteria doubles every 8 hours. If the amount of bacteria is represented by the letter *A*, and the elapsed time (*in hours*) is represented by the letter *t*, the formula used to find the amount of bacteria as time passes is:



$$A = 5000(2)^{\frac{t}{8}}$$

The quantity of bacteria in the culture after 16 hours is:

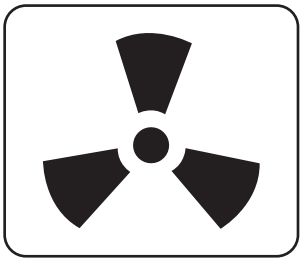
A. 5000

B. 8000

C. 10000

D. 20000

33. Over time, a sample of a radioactive isotope will lose its mass. The length of time for the sample to lose half of its mass is called the *half-life* of the isotope. Carbon-14 is a radioactive isotope commonly used to date archaeological finds. It has a half-life of 5730 years. If the initial mass of a Carbon-14 sample is 88 g, the formula used to find the mass remaining as time passes is given by:



$$A = 88\left(\frac{1}{2}\right)^{\frac{t}{5730}}$$

where *A* is the amount *(grams)*, and *t* is time *(years)* since the mass of the sample was measured. If the mass of the sample is measured 10000 years in the future, the percentage of the original mass that remains is:

A. 14%

B. 20%

C. 26%

D. 30%

Numbers, Radicals, and Exponents - ANSWER KEY

Video solutions are in italics.

1. **C** *Number Sets, Example 1c*
2. **B** *Number Sets, Example 1e*
3. **C** *Number Sets, Example 1g*
4. **D** *Number Sets, Example 3*
5. **C** *Number Sets, Example 4b*
6. **C** *Primes, LCM, and GCF, Example 1*
7. **D** *Primes, LCM, and GCF, Example 2c*
8. **C** *Primes, LCM, and GCF, Example 3c*
9. **B** *Primes, LCM, and GCF, Example 4a*
10. **C** *Primes, LCM, and GCF, Example 5c*
11. **D** *Squares, Cubes, and Roots, Example 4d*
12. **A** *Squares, Cubes, and Roots, Example 5a*
13. **A** *Squares, Cubes, and Roots, Example 6b*
14. **B** *Squares, Cubes, and Roots, Example 7b*
15. **B** *Radicals, Introduction (b)*
16. **A** *Radicals, Example 1b*
17. **B** *Radicals, Example 2d*
18. **D** *Radicals, Example 4d*
19. **B** *Radicals, Example 6c*
20. **D** *Radicals, Example 6e*
21. **B** *Radicals, Example 7e*
22. **C** *Radicals, Example 8e*
23. **C** *Exponents I, Example 1c*
24. **D** *Exponents I, Example 2f*
25. **C** *Exponents I, Example 3e*
26. **B** *Exponents I, Example 4d*
27. **D** *Exponents II, Example 1e*
28. **C** *Exponents II, Example 2e*
29. **A** *Exponents II, Example 4a*
30. **C** *Exponents II, Example 5b*
31. **A** *Exponents II, Example 6c*
32. **D** *Exponents II, Example 7*
33. **D** *Exponents II, Example 8*

Math 10C Practice Exam: Tips for Students

• Every question in the practice exam has already been covered in the Math 10C workbook. It is recommended that students refrain from looking at the practice exam until they have completed their studies for the unit.

• Do not guess on a practice exam. The practice exam is a self-diagnostic tool that can be used to identify knowledge gaps. Leave the answer blank and study the solution later.