Functions and Exponents Practice

Name: _____ **Date:** _____

1. If $g(x) = 3|x-2| - x$, what is $g(0.5)$?

   A. -5 B. -2 C. 1 D. 4

2. Josh hit a baseball straight up into the air. The equation below describes the height of the ball (h), in meters, as a function of time (t) in seconds.

   $h(t) = -9.8t^2 + 30t + 1.5$

   What is the height of the ball after 3 seconds?

   A. 3.3 meters B. 62.1 meters

   C. 120.9 meters D. 179.7 meters

3. Given $f(x) = x^3 + x^2 - x$, what is $f(4)$?

   A. 16 B. 76 C. 256 D. 1,024

4. The following exponential function describes the growth of a certain plant cell in t hours.

   $$p(t) = 3 \cdot 16^t$$

   How many plant cells are there after $\frac{3}{4}$ hour?

   A. 12 B. 18 C. 24 D. 36

5. The population of a town is 345,000. The function $f(t) = 345,000(1.2)^t$ gives the predicted population of the town in t years. *Approximately* what will the population be in 3 years?

   A. 350,000 B. 600,000

   C. 700,000 D. 1,250,000

6. The value of Mr. Dulaney's car x years after its purchase is given by the function $V(x) = 15,000(0.87)^x$. *Approximately*, what was the value of Mr. Dulaney's car 5 years after its purchase?

   A. \$7,500 B. \$8,600

   C. \$9,900 D. \$13,100

7. The height, $h(t)$, in feet of an object thrown into the air with an initial upward velocity of 63 feet per second is given by the formula $h(t) = -16t^2 + 63t$, where t is the time in seconds. What is the height of the object after 3 seconds?

   A. 45 ft B. 59 ft C. 81 ft D. 93 ft

8. The function $f(x) = 10,000 - 1,500x$ can be used to predict the number of termites in an area x days after the area has been treated. How many termites are predicted in the area after 5 days?

9. If $f(x) = 2x^3 - 2$, what is the value of $f(2)$?

A. 6 B. 10 C. 14 D. 62

10. If $f(x) = \left| x^3 - 3 \right|$, then $f(-1)$ is equivalent to

A. 0 B. 2 C. -2 D. 4

11. What is the value of the expression $2x^{-\frac{1}{3}}$ when $x = 8$?

A. 1 B. 2 C. $\frac{1}{2}$ D. $\frac{1}{4}$

12. If x is a positive integer, $4x^{\frac{1}{2}}$ is equivalent to

A. $\frac{2}{x}$ B. $2x$ C. $4\sqrt{x}$ D. $4\frac{1}{x}$

13. The expression $b^{-\frac{2}{3}}$, $b > 0$, is equivalent to

A. $\frac{1}{\left(\sqrt[3]{b}\right)^2}$ B. $\frac{1}{\left(\sqrt{b}\right)^2}$

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

14. If $(a^x)^{\frac{2}{3}} = \frac{1}{a^2}$, what is the value of x?

A. 1 B. 2 C. -3 D. -1

15. The expression $4^{\frac{1}{2}} \cdot 2^3$ is equal to

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

16. The expression $8^{-\frac{2}{3}}$ is equivalent to

A. $\frac{1}{4}$ B. $-\frac{1}{4}$ C. -4 D. 4

17. If $x = 4$, the value of $4x^{\frac{1}{2}} + (x^0 + 3)^{-1}$ is

A. $\frac{11}{28}$ B. $4\frac{1}{3}$ C. $8\frac{1}{7}$ D. $8\frac{1}{4}$

18. The value of $(-64)^{\frac{2}{3}}$ is

A. 16 B. -16 C. $-\frac{1}{16}$ D. 512

19. When simplified, the expression $\left(\sqrt[3]{m^4}\right)\left(m^{-\frac{1}{2}}\right)$ is equivalent to

A. $\sqrt[3]{m^{-2}}$ B. $\sqrt[4]{m^3}$

C. $\sqrt[5]{m^{-4}}$ D. $\sqrt[6]{m^5}$

20. If $n > 0$, the expression $(\frac{1}{n})^{-\frac{2}{3}}$ is equal to

A. $-n^{\frac{2}{3}}$ B. $-n^{\frac{3}{2}}$ C. $\sqrt[3]{n^2}$ D. $\sqrt{n^3}$