

Radical Functions and Rational Exponents Practice

Nathan Sykes is taking this assessment.

1. Which expression is equivalent to the one shown below? (1 point)

$$(4z)^{-3} \times (2z)^5$$

- ☐ z^2 over 2
- ☐ $2z^2$
- ☐ $8z^2$
- ☐ $\frac{5z^2}{6}$

2. Simplify the radical expression. (1 point)

$$\sqrt[3]{125x^9}$$

- ☐ $5x^3$
- ☐ $5x^6$
- ☐ $25x^3$
- ☐ $25x^9$

3. Find the real square root of 0.81. (1 point)

- ☐ 0.09
- ☐ 0.9
- ☐ 9.0
- ☐ 0.6561

4. Find the real number roots. (1 point)

$$\sqrt{-0.25}$$

- ☐ -0.5
- ☐ 0.5
- ☐ 5.5
- ☐ no real number roots

5. How can you write the expression with a rationalized denominator? (1 point)

$$2 + \sqrt{5} \text{ over } 2 - \sqrt{5}$$

- ☐ -1
- ☐ 1
- ☐ $9 + 4\sqrt{5}$
- ☐ $-9 - 4\sqrt{5}$

6. What is the simplest form of the number? (1 point)

$$64^{\frac{2}{3}}$$

- ☐ 512
- ☐ 96
- ☐ 16
- ☐ 42.67

7. Let $f(x) = x - 3$ and $g(x) = x^2$. (1 point)

Find $f(g(4))$.

- ☐ 1
- ☐ 9
- ☐ 13
- ☐ 16

8. Find the inverse of the function. (1 point)

$$y = -2 \text{ over } x + 4$$

- ☐ $x = \frac{4y - 3}{y}$
- ☐ $y = 4x \text{ over } 3$
- ☐ $y = x - 3 \text{ over } x$
- ☐ $y = -4x - 3 \text{ over } x$

9. Scientists can estimate the number of bacteria in a refrigerated food using the formula

$N(t) = 10b \cdot 2^{-t/20}$ where b is the number of bacteria and t is the time in seconds. What was the approximate time a food was in a refrigerator if there were 625 bacteria?

(1 point)

- ☐ 30 seconds
- ☐ 40 seconds
- ☐ 50 seconds
- ☐ 60 seconds

10. What function is shown by the graph below? (1 point)

$$y = \frac{1}{2}x + 1$$



- ☐ $f(x) = \text{root } x \text{ minus } 2$
- ☐ $f'(x) = \sqrt{x+2}$
- ☐ $f(x)$ equals root x minus 2
- ☐ $f'(x) = \sqrt{x} + 2$

11. What function is shown by the graph below? (1 point)



- ☐ $f(x) = 1 + 1 \text{ over } 2 \text{ root } x \text{ minus } 2$
- ☐ $f(x) = 1 + 1 \text{ over } 2 \text{ root } 2 \text{ minus } x$
- ☐ $f(x) = 1 + \text{root } x + 2$
- ☐ $f'(x) = 1 + \sqrt[3]{x-2}$

12. In a tornado, the wind velocity in meters per second can be described by the function (1 point)

$v(p) = 12.3 \sqrt{134 - 3p}$ where p is the air pressure in millibars. What is the air pressure of a tornado in which the wind velocity is 49.3 meters per second? Round your answer to the nearest whole millibar.

- ☐ 273 millibars
- ☐ 373 millibars
- ☐ 473 millibars
- ☐ 573 millibars

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