**Topic 5 Assessment**

Name _____

| | |
|---|---|
| 1 | Find the value of the expression. $$\sqrt{5^4} = \boxed{\phantom{xxxx}}$$ |
| 2 | Find the value of the expression. $$\sqrt[5]{-243} = \boxed{\phantom{xxxx}}$$ |
| 3 | What is the simplified form of $\sqrt[3]{27x^9y^3}$<br><br>☐    A. $9x^3y$<br><br>☐    B. $3x^3$<br><br>☐    C. $3x^3y$<br><br>☐    D. $9x^3$ |
| 4 | Multiply $(\sqrt{a} - 2)(\sqrt{a} + 2)$.<br><br>☐    A. $a - 2$<br><br>☐    B. $a^2 - 2$<br><br>☐    C. $a - 4$<br><br>☐    D. $a^2 - 4$ |
| 5 | Which of the following is equivalent to $\dfrac{2}{1+\sqrt{5}}$?<br><br>☐    A. $\dfrac{1+\sqrt{5}}{2}$<br><br>☐    B. $\dfrac{1-\sqrt{5}}{2}$<br><br>☐    C. $\dfrac{\sqrt{5}-1}{2}$<br><br>☐    D. $\sqrt{5} - 2$ |

| 6 | The graph of $y = \sqrt{x}$ has been translated to the right 3 units and down 9 units. What is the equation of the translated graph? |
|---|---|
| | $\square$     A. $y = 3 + \sqrt{x + 9}$ |
| | $\square$     B. $y = 9 - \sqrt{x + 3}$ |
| | $\square$     C. $y = 3 - \sqrt{9 - x}$ |
| | $\square$     D. $y = -9 + \sqrt{x - 3}$ |
| 7 | The function $a$ has domain $x \geq 2$ and range $y \leq -1$. Complete this sentence: |
| | The domain of $a^{-1}$ is   ✓ Choose...     and the range is   ✓ Choose... |
| |    $x \geq -1$                        $y \geq 2$ |
| |    $x \leq -1$                        $y > 2$ |
| |    $x \leq 2$                         $y \leq -1$ |
| | Circle the correct answers.    $x \geq 2$                    $y > -1$ |
| 8 | Which graph shows the function $f(x) = 3 + \sqrt{x}$? |
| | $\square$    A.                           ○ B. |
| | $\square$    C.                           ○ D. |
| 9 | Which of the following are real numbers? Select all that apply. |
| | $\square$     A. $\sqrt{12}$ |
| | $\square$     B. $\sqrt{0}$ |
| | $\square$     C. $\sqrt[3]{-1}$ |
| | $\square$     D. $\sqrt[4]{-1}$ |

| 10 | The volume of a cube is 1.5 m³. Find the length of its edge to the nearest tenth of a meter.<br><br>edge length = [_____] m |
|---|---|
| 11 | Multiply $\sqrt{2}(2\sqrt{0.125} + \sqrt{18})$<br><br>product = [_____]<br><br>*Hint: Use calculator |
| 12 | Which of the following is an increasing function?<br><br>☐  A. $f(x) = \sqrt{x^2}$<br><br>☐  B. $f(x) = \frac{1}{\sqrt{x}}$<br><br>☐  C. $f(x) = 1 - \sqrt{x}$<br><br>☐  D. $f(x) = 1 + \sqrt{x}$ |
| 13 | Let $f(x) = \sqrt{x}$ and $g(x) = 3 - x$. What is the domain of $f \circ g$?<br><br>☐  A. $x > 3$<br><br>☐  B. $x < 3$<br><br>☐  C. $x \geq 3$<br><br>☐  D. $x \leq 3$ |
| 14 | If $a(x) = 2 - 8x$, what is an equation for $a^{-1}(x)$?<br><br>☐  A. $a^{-1}(x) = \frac{x-2}{8} = \frac{2-x}{-8}$<br><br>☐  B. $a^{-1}(x) = \frac{2-x}{8} = \frac{x-2}{-8}$<br><br>☐  C. $a^{-1}(x) = \frac{x-8}{2} = \frac{8-x}{-2}$<br><br>☐  D. $a^{-1}(x) = x - 4 = \frac{4-x}{-1}$ |

| 15 | Evaluate the expression $\sqrt{x^2 + 2x + 1}$ when $x = -5$. |
|---|---|
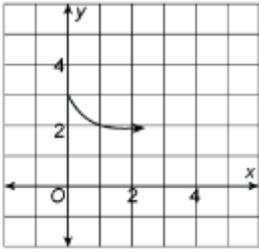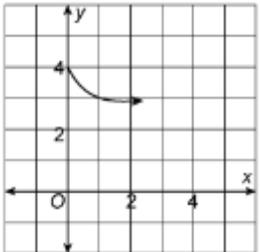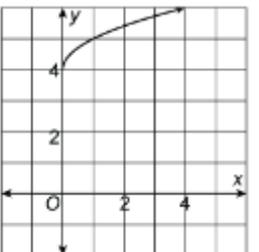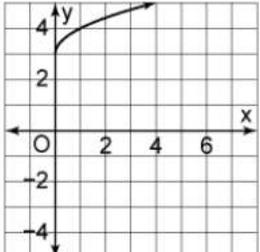
☐    A. $-4$

☐    B. $4$

☐    C. $\sqrt{6}$

☐    D. $6$

| 16 | Some values of $f(x)$ are given in the table. Find the value of $f^{-1}(6)$. |
|---|---|

| x | -6 | 6 | 10 |
|---|---|---|---|
| f(x) | -6 | 3 | 6 |

$f^{-1}(6) = \boxed{\phantom{xxxx}}$

| 17 | A cylindrical pipe is 9 ft long and has a volume of 100 ft³. Find the approximate diameter to the nearest hundredth of a foot. $V = Bh$ |
|---|---|

☐ A. 1.88 ft

☐ B. 2.23 ft                Radius : _____

☐ C. 3.33 ft                Diameter : _____

☐ D. 3.76 ft

| 18 | Solve $(x+5)^{\frac{3}{2}} = (x-1)^3$ |
|---|---|

$x = \boxed{\phantom{xxxx}}$

| 19 | What is the value of $x$ in $\sqrt{x} + \sqrt{x+2} = 2$? |
|---|---|

☐ A. $\frac{1}{4}$

☐ B. $\frac{1}{2}$

☐ C. 2

☐ D. 4

| | |
|---|---|
| 20 | A store offers a $30-off sale on bicycles and a 10% discount on the purchase price. Let $x$ represent the price in dollars, and let $f(x) = x - 30$ and $g(x) = x - 0.10x = 0.90x$ represent the discounts. Which function can the store manager use to find the final price?<br><br>☐ A. $f + g$<br><br>☐ B. $f \times g$          Note: The store will apply the 10% discount first, then take the $30 off.<br><br>☐ C. $\frac{f}{g}$<br><br>☐ D. $f \circ g$ |
| 21 | Solve $\sqrt{6 + 2x} = 1 + \sqrt{x + 4}$<br><br>☐ A. $-1$<br><br>☐ B. $0$<br><br>☐ C. $2$<br><br>☐ D. $5$ |
| 22 | The volume of a sphere is $V(r) = \frac{4}{3}\pi r^3$ and the radius is increasing 2 mm per second. The function $r(t) = 2t$ gives the radius at time $t$ seconds. Which function gives the volume at time $t$?<br><br>☐ A. $(V \circ r)(t)$<br><br>☐ B. $(r \circ V)(t)$<br><br>☐ C. $(r + V)(t)$<br><br>☐ D. $(V \cdot r)(t)$ |
| 23 | Solve $\sqrt{x^2} = x$.<br><br>☐ A. all values of $x$<br><br>☐ B. all values of $x \mid x \geq 1$<br><br>☐ C. all values of $x \mid x \geq 0$<br><br>☐ D. all values of $x \mid x \leq 0$ |