Name _____ Date _____

CHAPTER 6

SAT/ACT Chapter Test

For use after Chapter 6

Multiple Choice

1. Which expression has the least value?

(A) $\sqrt[3]{3375}$ (B) $5^{4/3}$

(C) $81^{2/3}$ (D) $(\sqrt[4]{4})^7$

(E) $(\sqrt[4]{256})^2$

2. What is the value of x in the equation $(x + 3)^5 = 243$?

(A) $x = 0$ (B) $x = \pm 3$

(C) $x = 3$ (D) $x = 6$

(E) $x = 0$ or $x = 6$

3. What is the simplest form of the expression $(2^3 4^3)^{-1/9}$?

(A) -2 (B) $8^{-1/3}$

(C) $\frac{1}{2}$ (D) 2

(E) 512

4. What is the simplest form of the expression $-\sqrt[4]{64} + 10\sqrt[5]{96}$?

(A) $-2\sqrt[4]{4} + 20\sqrt[5]{3}$

(B) $304(\sqrt[4]{4} + \sqrt[5]{3})$

(C) $-64 + 80\sqrt[5]{6}$

(D) $-4\sqrt[4]{16} + 40\sqrt[5]{24}$

(E) $9(\sqrt[4]{64} + \sqrt[5]{96})$

5. What is the simplest form of the expression $4\sqrt[3]{5w^7} + w^3\sqrt[3]{625w^4}$?

(A) $12w^2\sqrt[3]{2w} + 208w^3\sqrt[3]{w}$

(B) $4w^3\sqrt[9]{3125w^{11}}$

(C) $\sqrt[3]{\frac{5}{4}w^7} + \sqrt[3]{625w}$

(D) $4w^6\sqrt[3]{5w} + 125w^6\sqrt[3]{5w}$

(E) $(4w^2 + 5w^4)\sqrt[3]{5w}$

6. What is $f(x) - g(x)$ if $f(x) = 5x^{3/2}$ and $g(x) = (4x)^{3/2}$?

(A) $x^{3/2}$ (B) $-x^{3/2}$

(C) $-3x^{3/2}$ (D) $3x^{3/2}$

(E) $(5 - \sqrt[3]{16})x^{3/2}$

7. Which expression is equal to $g(f(x))$ if $f(x) = x^3 - 1$ and $g(x) = 6x^{-2}$?

(A) $6x^{-2}(x^3 - 1)$ (B) $(6x^{-2})^3 - 1$

(C) $\frac{216}{x^{-6}} - 1$ (D) $6(x^3 - 1)^{-2}$

(E) $\frac{6}{(x^3 - 1)^{-2}}$

8. A store that sent you a coupon for 10% off any item has a sale for \$5 off all jeans. The pair you want is \$39.50. What do you pay if the 10% off must be applied after the \$5 is taken off?

(A) \$3.45 (B) \$19.75

(C) \$30.55 (D) \$30.72

(E) \$31.05

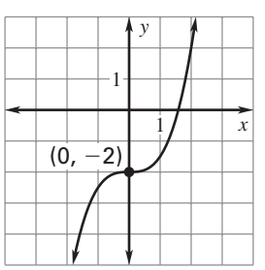
9. What is the inverse of $y = 10x - 2$?

(A) $y = \frac{1}{10}x - \frac{1}{2}$ (B) $y = -5x$

(C) $y = \frac{x + 2}{10}$ (D) $y = 10(x + 2)$

(E) $y = 10(x - 2)$

10. What is the inverse of the graph shown?



(A) $y = \frac{1}{2}x^3 - 2$

(B) $y = \sqrt[3]{2(x + 2)}$

(C) $y = \sqrt[3]{2(x - 2)}$

(D) $y = \sqrt[3]{\frac{1}{2}(x + 2)}$

(E) $y = -\frac{1}{2}x^3 - 2$

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CHAPTER 6

SAT/ACT Chapter Test *continued*

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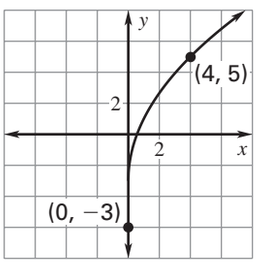
11. What is the domain and range, respectively, of the function $g(x) = -\frac{1}{3}\sqrt{x}$?

(A) $x \geq 0, y \geq 0$ (B) $x \geq 0, y \leq 0$

(C) $x \leq 0, y \leq 0$ (D) $x \leq 0, y \geq 0$

(E) $y \geq 0, x \leq 0$

12. The graph of which function is shown?



(A) $y = 4\sqrt{x} - 3$

(B) $y = 4\sqrt{x} + 3$

(C) $y = \sqrt{4x} - 3$

(D) $y = 4\sqrt{x - 3}$

(E) $y = \frac{1}{4}\sqrt{x} - 3$

13. The graph of $y = 2\sqrt[3]{x}$ is shifted down 5 units. What is the equation of the translated graph?

(A) $y = 2\sqrt[3]{x + 5}$

(B) $y = 2\sqrt[3]{x - 5}$

(C) $y = -3\sqrt[3]{x}$

(D) $y = 2\sqrt[3]{x} - 5$

(E) $y = 2\sqrt[3]{x} + 5$

14. What is the solution of $\sqrt{2x + 4} = x - 2$?

(A) 0 (B) -6

(C) -2 (D) 2

(E) 6

15. What is (are) the solution(s) of $x + 3 = \sqrt{2x + 41}$?

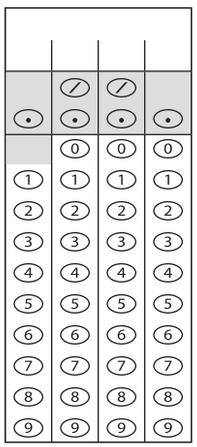
(A) -8 (B) $-8, 4$

(C) $0, 4$ (D) 4

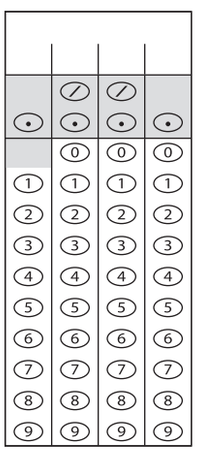
(E) No solution

Gridded Answer

16. What is the value of $81^{-3/4}$?



17. What is the y-intercept of the graph of the inverse of $y = \frac{3}{8}x - \frac{1}{8}$?



18. What is the extraneous solution to the equation $x - 4 = \sqrt{2x}$?