UB SAT 2009
Worksheet #5
Exponents and Roots

Solve for x.

1. $x^2 = 4$
2. $x^2 = 36$
3. $x^2 = 169$
4. $x^3 = 27$
5. $x^3 = -8$
6. $x^3 = 216$
7. $x^4 = 81$
8. $x^4 = 2401$
9. $x^{1/2} = 4$
10. $x^{2/3} = 16$
11. $x^{2/5} = 9$
12. $x^{2/7} = 4$
13. $x^{3/2} = 64$
14. $x^{3/4} = 8$
15. $x^{3/5} = -27$
16. $x^{4/3} = 16$
17. $x^{5/6} = 3125$
18. $x^{1/3} = 5$
19. $x^{-2} = 4$
20. $x^{-2} = \frac{25}{36}$
21. $x^{-3} = 125$
22. $x^{-3} = -\frac{8}{27}$
23. $x^{-2/3} = 16$
24. $x^{-3/2} = \frac{1}{27}$

Simplify.

25. $\sqrt{16}$
26. $\sqrt{144}$
27. $\sqrt{324}$
28. $\sqrt{48}$
29. $\sqrt{96}$
30. $\sqrt{98}$
31. $\sqrt{125}$
32. $\sqrt{8}$
33. $\sqrt{12}$
34. $\sqrt{63}$
35. $\sqrt{180}$
36. $\sqrt{128}$
37. $\sqrt{768}$
38. $\sqrt{338}$
39. $\sqrt{363}$

Solve for y.

40. $y^2 = 8$
41. $y^2 = 27$
42. $y^2 = 54$
43. $y^2 = 24$
44. $y^2 = 300$
45. $y^2 = 320$
46. $y^2 = 432$
47. $y^2 = 108$
48. $y^2 = 80$

SAT practice: real sample SAT problems for past tests from the book 10 Real SATs.

1. $2^4 \times 4^3 =$

(A) 8^{12} (B) 8^7 (C) 6^7 (D) 2^{10} (E) 2^7

2. $6\sqrt{9} \times 2\sqrt{16} =$

(A) 72 (B) 144 (C) 288 (D) 864 (E) 1728

3. If $x = 9a^2$ and $a > 0$, then $\sqrt{x} =$

(A) $-3a$ (B) $3a$ (C) $9a$ (D) $3a^2$ (E) $81a^4$

4. If $x^{-3} = 27$, $x =$

(A) -3 (B) $-\frac{1}{3}$ (C) $\frac{1}{3}$ (D) 3 (E) 9

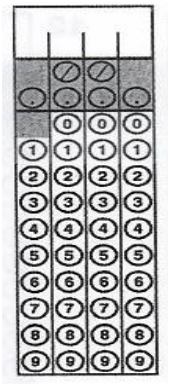
5. If $n^{-4} = \frac{1}{28561}$, what is the value of n?

(A) $\frac{1}{169}$ (B) $-\frac{1}{13}$ (C) $\frac{1}{28561}$ (D) $\frac{1}{13}$ (E) 13

6. If $m^{\frac{3}{2}} = 8$, what is the value of m?

(A) 2 (B) 4 (C) 6 (D) 10 (E) $16\sqrt{2}$

7. $\dfrac{4^3 - 4^2}{2^2} =$



8. If $x > 0$, then $(4^x)(8^x) =$

(A) 2^{9x} (B) 2^{8x} (C) 2^{6x} (D) 2^{5x} (E) 2^{4x}

9. If $\dfrac{\sqrt{n}}{3}$ is an even integer, which of the following could be the value of n?

(A) 27 (B) 48 (C) 81 (D) 121 (E) 144

10. Which of the following is equal to 8^5?

I. $2^5 \times 4^5$
II. 2^{15}
III. $2^5 \times 2^{10}$

(A) II only (B) I and II (C) I and III (D) II and III (E) I, II and III

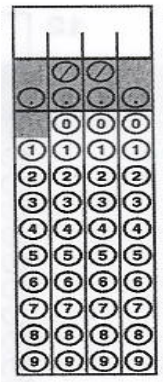
11. If $2\sqrt{c} + 3 = 5$, what is the value of c?

(A) 0 (B) 1 (C) $\sqrt{2}$ (D) 2 (E) 3

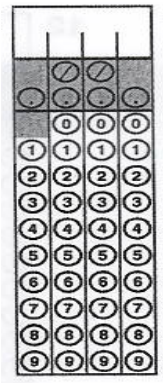
12. If $\sqrt{x + y} = 5x$, what is the value of y in terms of x?

(A) $25x$ (B) $5x^2$ (C) $25x^2$ (D) $25x^2 - x$ (E) 25

13. If $s^2t^{-2} = 1$ and $st = -4$, what is the value of $s + t$?



14. If $x = 2$, then $3^x + (x^3)^2 =$



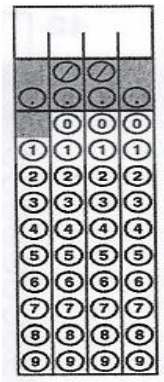
15. If $xyz \neq 0$, then $\dfrac{x^2y^6z^{10}}{xy^3z^5} =$

(A) xy^2z^2 (B) xy^3z^5 (C) $x^2y^2z^2$ (D) $x^2y^3z^5$ (E) $x^3y^9z^{15}$

16. What is the remainder when $2x^3 - x^2 + 3x - 4$ is divided by $x + 2$?

(A) -34 (B) -30 (C) 0 (D) 13 (E) 30

17. If $5^n > 10000$ and n is an integer, what is the smallest possible value of n?



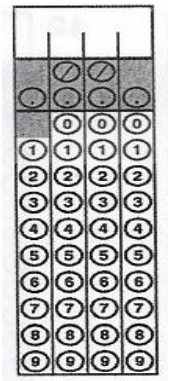
18. If $\frac{x}{x^{1.5}} = 8x^{-1}$ and $x > 0$, then $x =$

(A) $\frac{\sqrt{2}}{4}$ (B) $2\sqrt{2}$ (C) 4 (D) 16 (E) 64

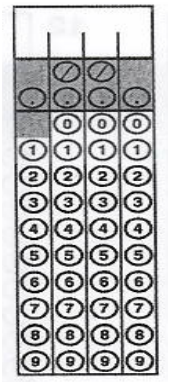
19. If $10^k = 64$, what is the value of $10^{\frac{k}{2}+1}$?

(A) 18 (B) 42 (C) 80 (D) 81 (E) 320

20. What is the value of $\left(\frac{b^0 - b^2}{b^0 + b}\right)^{-1/2}$ when $b = \frac{3}{4}$?



21. If $\sqrt{x} \cdot \sqrt[3]{x} \cdot \sqrt[k]{x} = x$, what is the value of k?



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Answers

1. $x = \pm 2$
2. $x = \pm 6$
3. $x = \pm 13$
4. $x = 3$
5. $x = -2$
6. $x = 6$
7. $x = \pm 3$
8. $x = \pm 7$
9. $x = 16$
10. $x = 64$
11. $x = 243$
12. $x = 128$
13. $x = 16$
14. $x = 16$
15. $x = -243$
16. $x = 8$
17. $x = 15,625$
18. $x = 125$
19. $x = \frac{1}{2}$
20. $x = \frac{6}{5}$
21. $x = \frac{1}{5}$
22. $x = -\frac{3}{2}$
23. $x = \frac{1}{64}$
24. $x = 9$
25. 4
26. 12
27. 18
28. $4\sqrt{3}$
29. $4\sqrt{6}$
30. $7\sqrt{2}$
31. $5\sqrt{5}$
32. $2\sqrt{2}$
33. $2\sqrt{3}$
34. $3\sqrt{7}$
35. $6\sqrt{5}$
36. $8\sqrt{2}$
37. $16\sqrt{3}$
38. $13\sqrt{2}$
39. $11\sqrt{3}$
40. $y = \pm 2\sqrt{2}$
41. $y = \pm 3\sqrt{3}$
42. $y = \pm 3\sqrt{6}$
43. $y = \pm 2\sqrt{6}$
44. $y = \pm 10\sqrt{3}$
45. $y = \pm 8\sqrt{5}$
46. $y = \pm 12\sqrt{3}$
47. $y = \pm 6\sqrt{3}$
48. $y = \pm 4\sqrt{5}$