Sample Test 1

1. Write 67.7 in scientific notation.

   (a) 6.77×10^2 (b) 6.77×10^1 (c) 6.77×10^{-2} (d) 6.77×10^{-1}

2. Simplify the expression $\dfrac{(xy^2z)^3}{x^{-1}yz}$.

   (a) $x^2y^5z^2$ (b) x^2yz^2 (c) $x^4y^5z^2$ (d) $x^2y^7z^4$

3. Factor $12y^2 + 17y + 6$ completely. Which of the following is a factor?

   (a) $y - 2$ (b) $3y + 2$ (c) $4y - 3$ (d) $y + 3$

4. Factor $25x^2 - 81$.

   (a) $(5x + 9)^2$ (b) $(5x + 9)(5x - 9)$ (c) Prime (d) $(5x - 9)^2$

5. What is a factor of $x^3 - 343$?

   (a) $x^2 + 49$ (b) $x + 343$ (c) $x^2 + 7x + 49$ (d) $x + 7$

6. Simplify the product $\dfrac{x^2 - 15x + 44}{x^2 - 9x + 8} \cdot \dfrac{x^2 - 13x + 12}{x^2 - 7x + 12}$.

   (a) $\dfrac{(x + 11)(x + 12)}{(x + 8)(x + 3)}$ (b) $\dfrac{(x^2 - 15x + 44)(x^2 - 13x + 12)}{(x^2 - 9x + 8)(x^2 - 7x + 12)}$

   (c) $\dfrac{(x - 11)(x - 12)}{(x - 8)(x - 3)}$ (d) $\dfrac{x - 11}{x - 3}$

7. Simplify the quotient $\dfrac{z^2 - 12z + 35}{z^2 - 14z + 45} : \dfrac{z^2 - 7z}{z^2 - 18z + 81}$.

   (a) $\dfrac{z + 9}{z^2 + 9z}$ (b) $z + 9$ (c) $\dfrac{z - 9}{z}$ (d) $\dfrac{z}{z^2 + 14z + 45}$

8. Simplify the difference $\dfrac{x}{x^2 - 16} - \dfrac{4}{x^2 + 5x + 4}$.

(a) $\dfrac{x^2-3}{(x-4)(x+4)(x+1)}$ (b) $\dfrac{x^2-3x+16}{(x-4)(x+4)}$ (c) $\dfrac{x^2-3x+16}{(x-4)(x+4)(x+1)}$
(d) $\dfrac{x^2+3x+16}{(x-4)(x+4)(x+1)}$

9. Simplify the radical expression $\sqrt[3]{\dfrac{x^3y^9}{8}}$.
(a) $\dfrac{xy^2}{8}$ (b) $\dfrac{x^3y}{2}$ (c) $\dfrac{xy^3}{2}$ (d) $\dfrac{xy^9}{2}$

10. Simplify the radicals and collect like terms in $8\sqrt{7}+4\sqrt{175}$.
(a) $-28\sqrt{7}$ (b) $28\sqrt{7}$ (c) $12\sqrt{7}$ (d) $-3\sqrt{7}$

11. Rationalize the denominator in $\dfrac{4}{9-\sqrt{2}}$.
(a) $\dfrac{36+4\sqrt{2}}{79}$ (b) $\dfrac{36-4\sqrt{2}}{79}$ (c) $\dfrac{4}{9}-\dfrac{4}{\sqrt{2}}$ (d) $\dfrac{36+4\sqrt{2}}{-7}$

12. Solve the equation $\dfrac{r+6}{5}=\dfrac{r+8}{7}$.
(a) -2 (b) 2 (c) 1 (d) -1

13. Solve the equation $3.7x+4.6-9.3x=-3.1-5.6x+7.7$.
(a) No solution (b) -1.5 (c) All real numbers (d) 0

14. Solve $\dfrac{6x+9}{3}=6\left(\dfrac{1}{3}x-\dfrac{1}{2}\right)+7$.
(a) All real numbers (b) No solution (c) 0 (d) $\frac{7}{4}$

15. The solution to an inequality is $-3 \le x < 1$. How would you write this using interval notation?
(a) $[-3,1]$ (b) $[-3,1)$ (c) $(-3,1)$ (d) $(-3,1]$

16. Solve the inequality $x-1<3x+1$.

(a) $(-2, \infty)$ (b) $(-1, \infty)$ (c) $[-1, \infty)$ (d) $(\infty, -2)$

17. Solve $|x - 2| + 5 \leq 14$.

(a) No solution (b) $[-7, 11]$ (c) $(-\infty, -7]$ (d) $(-\infty, -7] \cup [11, \infty)$

18. Solve $|3x - 8| + 9 > 12$.

(a) $[5/3, 11/3]$ (b) $(5/3, 11/3)$ (c) $(-\infty, 5/3) \cup (11/3, \infty)$ (d) $(-\infty, 5/3] \cup [11/3, \infty)$

19. What is the number of solutions of $x^2 - 11x + 2 = 0$? (Use the discriminant!)

(a) no solution (b) one solution (c) two solutions (d) three solutions

20. What is the number of solutions of $x^2 - x + 20 = 0$? (Use the discriminant!

(a) no solution (b) one solution (c) two solutions (d) three solutions

21. Solve $2x^2 - 5x + 1 = 0$.

(a) $\dfrac{5 \pm \sqrt{17}}{4}$ (b) $\dfrac{-5 \pm \sqrt{17}}{4}$ (c) $\dfrac{5 \pm \sqrt{17}}{2}$ (d) $\dfrac{5 \pm \sqrt{33}}{4}$

Solution key:

1. b
2. a
3. b
4. b
5. c
6. c
7. c
8. c
9. c
10. b
11. a
12. d
13. c
14. b
15. b
16. b
17. b
18. c
19. c
20. a
21. a