

MULTIPLE CHOICE. There are 34 algebraic equations or inequalities to solve. Select the letter of the most appropriate answer and SHADE in the corresponding region of the answer sheet. No credit is given for any marks on the answer sheet except the complete shading of the correct choice!

Solve the equation.

1. $-5x + 5 + 2(x + 1) = 5x + 1$

A) $\left\{\frac{6}{5}\right\}$

B) $\left\{-\frac{4}{5}\right\}$

C) $\left\{-\frac{1}{2}\right\}$

D) $\left\{\frac{3}{4}\right\}$

2. $3^2 - 2(8 - 5)^2 = 18x$

A) $\left\{-\frac{1}{2}\right\}$

B) $\{0\}$

C) $\{2\}$

D) $\left\{\frac{7}{2}\right\}$

3. $\frac{5x}{9} - x = \frac{x}{36} - \frac{3}{4}$

A) $\left\{-\frac{27}{17}\right\}$

B) $\left\{\frac{9}{5}\right\}$

C) $\left\{\frac{27}{17}\right\}$

D) $\left\{-\frac{9}{5}\right\}$

4. $\frac{10}{x} = \frac{5}{2x} + 60$

A) $x \neq 0, 2; \left\{\frac{25}{6}\right\}$

B) $x \neq 0; \left\{\frac{1}{8}\right\}$

C) $x \neq 0; \{8\}$

D) No restrictions; $\{4\}$

5. $\frac{x}{2x+2} = \frac{-2x}{4x+4} + \frac{2x-3}{x+1}$

A) $\left\{\frac{3}{2}\right\}$

B) $\{3\}$

C) $\{-3\}$

D) $\left\{-\frac{12}{5}\right\}$

6. $\frac{1}{x+6} + \frac{4}{x+5} = \frac{-1}{x^2 + 11x + 30}$

A) $\{5\}$

B) $\{0\}$

C) $\emptyset$

D) $\{-6\}$

7. $2 - 10x = (3x - 7)(x + 1)$

A) $\{-3, 1\}$

B) $\left\{\frac{1}{5}\right\}$

C) $\{-1, 3\}$

D) $\left\{-1, \frac{7}{3}\right\}$

8. $\sqrt{5x - 4} = 4$

A) $\{4\}$

B) $\emptyset$

C) $\left\{\frac{12}{5}\right\}$

9. $(5x - 4)^2 = 8$

A) $\{-2\sqrt{5}, 2\sqrt{5}\}$

C) $\left\{\frac{-4 - 2\sqrt{2}}{5}, \frac{-4 + 2\sqrt{2}}{5}\right\}$

B) $\left\{\frac{4 - 2\sqrt{2}}{5}, \frac{4 + 2\sqrt{2}}{5}\right\}$

D) $\left\{-\frac{4}{5}, \frac{12}{5}\right\}$

10. $2x^2 = -10x - 3$

A) $\left\{\frac{-5 - \sqrt{31}}{2}, \frac{-5 + \sqrt{31}}{2}\right\}$

C) $\left\{\frac{-5 - \sqrt{19}}{2}, \frac{-5 + \sqrt{19}}{2}\right\}$

B) $\left\{\frac{-5 - \sqrt{19}}{4}, \frac{-5 + \sqrt{19}}{4}\right\}$

D) $\left\{\frac{-10 - \sqrt{19}}{2}, \frac{-10 + \sqrt{19}}{2}\right\}$

11. $x^2 + 6x + 18 = 0$

A) $\{-3 - 9i, -3 + 9i\}$

B) $\{-3\}$

C) $\{0, -6\}$

D) $\{-3 + 3i, -3 - 3i\}$

E) $\{-3 + 3i\}$

12. $x - \sqrt{3x - 2} = 4$

A) $\{-1\}$

B) $\{1, 2\}$

C) $\{2, 9\}$

D) $\{9\}$

13. $\sqrt{x+6} + \sqrt{2-x} = 4$

A) $\{2, -2\}$

B) $\{\sqrt{31}, -2\}$

C) $\{-2\}$

D) $\{0\}$

14. $(x+9)^{3/2} = 8$

A) $\{-7\}$

B) $\{-5\}$

C) $\left\{\sqrt[3]{2} - 9\right\}$

D) $\{13\}$

15. $3|x - 3| = 18$

A) $\{3, -9\}$

B) $\{3\}$

C) $\{9, -3\}$

D) $\emptyset$

16. $|2x - 6| - 1 = -5$

A) $\{1, -5\}$

B) $\{5, -1\}$

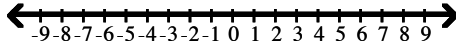
C) $\{1\}$

D) $\emptyset$

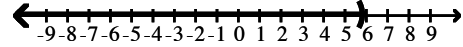
Solve the inequality. Other than $\emptyset$, use interval notation to express the solution set and graph the solution set on a number line.

17. $5(4x+6) - 4x < 4(7+4x) - 6$

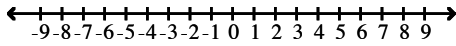
A) $(-\infty, \infty)$



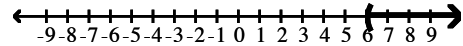
B) $(-\infty, 6)$



C) $\emptyset$

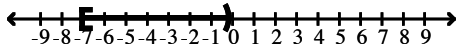


D) $(6, \infty)$

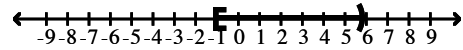


18. $-4 < x + 3 \leq 3$

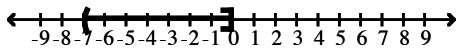
A) $[-7, 0)$



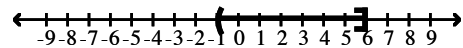
B) $[-1, 6)$



C) $(-7, 0]$

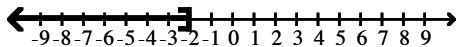


D) $(-1, 6]$

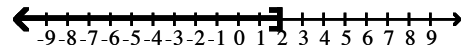


19. $-8x \geq 16$

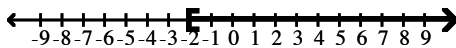
A) $(-\infty, -2]$



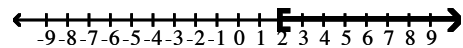
B) $(-\infty, 2]$



C) $[-2, \infty)$

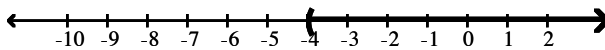


D) $[2, \infty)$

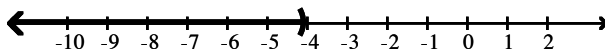


20. $-6(5x - 7) < -36x + 18$

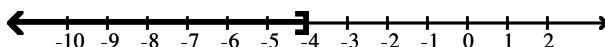
A) $(-4, \infty)$



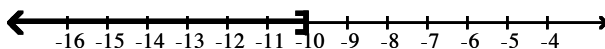
B) $(-\infty, -4)$



C) $(-\infty, -4]$

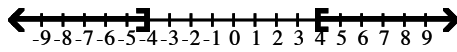


D) $(-\infty, -10]$

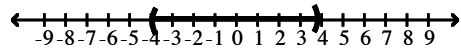


21. $|x| < 4$

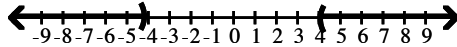
A) $(-\infty, -4] \cup [4, \infty)$



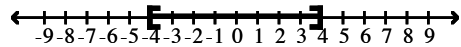
B) $(-4, 4)$



C) $(-\infty, -4) \cup (4, \infty)$

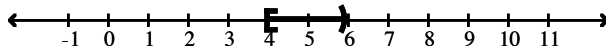


D) $[-4, 4]$

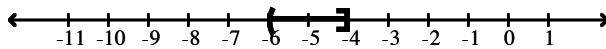


22. $-10 \leq -2x + 2 < -6$

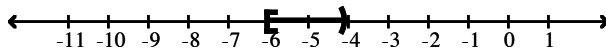
A) $[4, 6)$



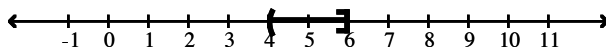
B) $(-6, -4]$



C) $[-6, -4)$

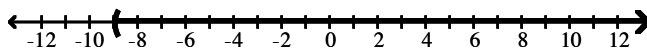


D) $(4, 6]$

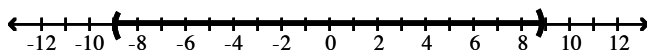


23. $|x + 9| > 0$

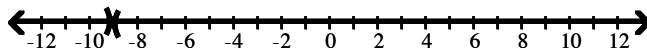
A) $(-9, \infty)$



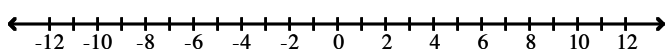
B) $(-9, 9)$



C) $(-\infty, -9) \cup (-9, \infty)$

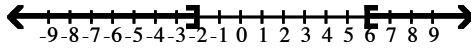


D) $\emptyset$

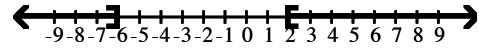


24. $3 + \left| 1 - \frac{x}{2} \right| \geq 5$

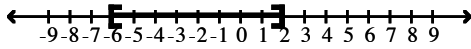
A) $(-\infty, -2] \cup [6, \infty)$



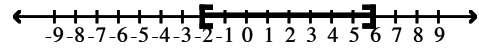
B) $(-\infty, -6] \cup [2, \infty)$



C) $[-6, 2]$

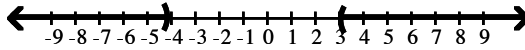


D) $[-2, 6]$

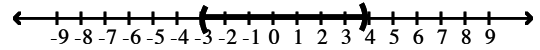


25. $(x - 4)(x + 3) > 0$

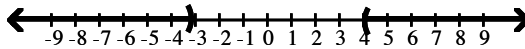
A) $(-\infty, -4) \cup (3, \infty)$



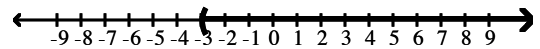
B) $(-3, 4)$



C) $(-\infty, -3) \cup (4, \infty)$

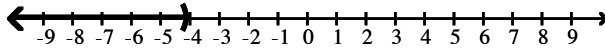


D) $(-3, \infty)$

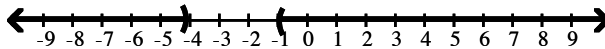


26. $x^2 + 5x + 4 > 0$

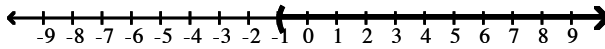
A) $(-\infty, -4)$



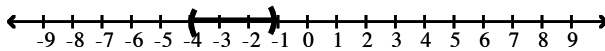
B) $(-\infty, -4) \cup (-1, \infty)$



C) $(-1, \infty)$

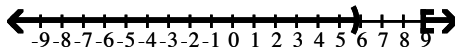


D) $(-4, -1)$

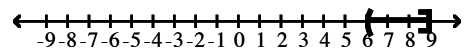


27. $\frac{-x+9}{x-6} \geq 0$

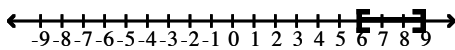
A) $(-\infty, 6)$ or $[9, \infty)$



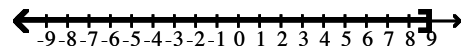
B) $(6, 9]$



C) $[6, 9]$

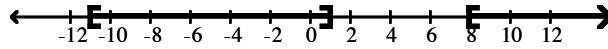


D) $(-\infty, 9]$

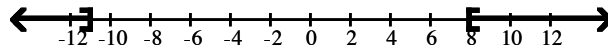


28. $\frac{(x+11)(x-8)}{x-1} \geq 0$

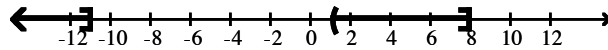
A) $[-11, 1] \cup [8, \infty)$



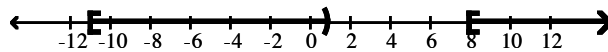
B) $(-\infty, -11] \cup [8, \infty)$



C) $(-\infty, -11] \cup (1, 8]$



D) $[-11, 1) \cup [8, \infty)$



Solve the exponential equation. Express the solution set in terms of natural logarithms.

29. $5^{x+8} = 3$

A) $\left\{ \frac{\ln 5}{\ln 3} + 8 \right\}$

B) $\left\{ \frac{\ln 5}{\ln 3} + \ln 8 \right\}$

C) $\{\ln 3 - \ln 5 - \ln 8\}$

D) $\left\{ \frac{\ln 3}{\ln 5} - 8 \right\}$

30. $4^{x+4} = 5^{2x+5}$

A) $\{7 \ln 5 - 5 \ln 4\}$

B) $\left\{ \frac{5 \ln 5 - 4 \ln 4}{\ln 4 - 2 \ln 5} \right\}$

C) $\{\ln 5 - \ln 4\}$

D) $\left\{ \ln \left[\frac{5^5}{4^4} - \frac{4}{5^2} \right] \right\}$

Solve the logarithmic equation. Be sure to reject any value that is not in the domain of the original logarithmic expressions. Give the exact answer.

31. $\log(5+x) - \log(x-2) = \log 2$

A) $\{9\}$

B) $\emptyset$

C) $\left\{ \frac{-1}{2} \right\}$

D) $\{-9\}$

Solve the system of equations.

32. $x - 3y = -22$

$-6x - 4y = 0$

A) $\{(-5, 7)\}$

B) $\{(4, 7)\}$

C) $\{(-4, 6)\}$

D) $\emptyset$

33. $-3x + 5y = 4$

$-5x + 4y = 11$

A) $\{(-3, 1)\}$

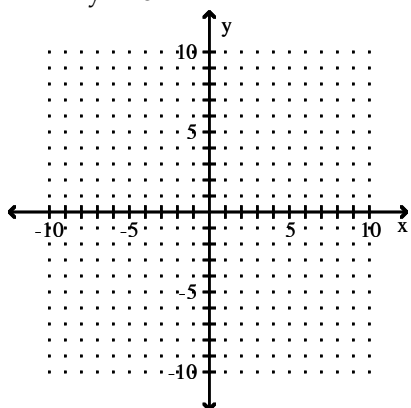
B) $\{(-3, -1)\}$

C) $\{(3, -1)\}$

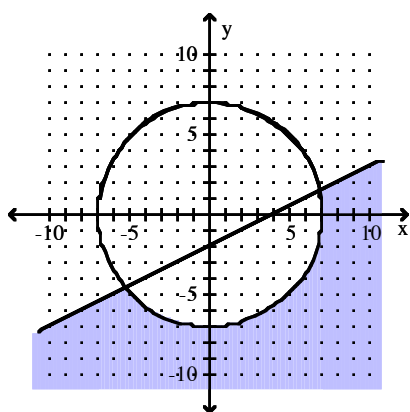
D) $\{(3, 1)\}$

Graph the solution set of the system of inequalities or indicate that the system has no solution.

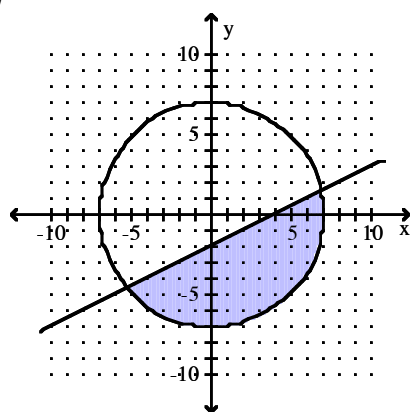
34. $x^2 + y^2 \leq 49$
 $-2x + 4y \leq -8$



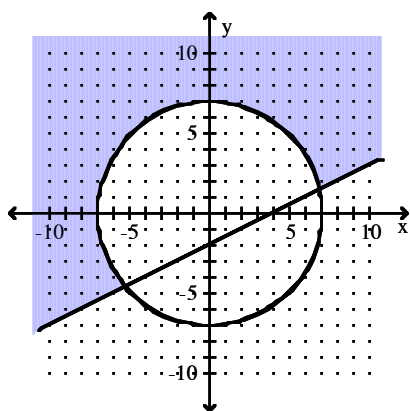
A)



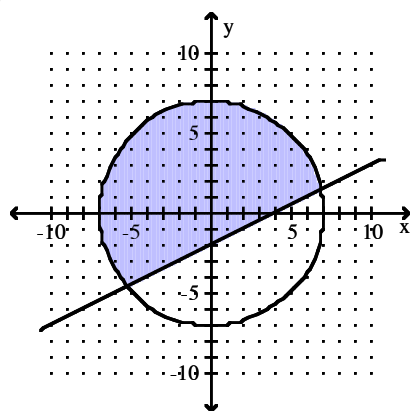
B)



C)



D)



Answer Key

Testname: ALG. EQUATIONS AND INEQUALITIES

1. D
2. A
3. C
4. B
5. B
6. C
7. A
8. A
9. B
10. C
11. D
12. D
13. C
14. B
15. C
16. D
17. C
18. C
19. A
20. B
21. B
22. D
23. C
24. A
25. C
26. B
27. B
28. D
29. D
30. B
31. A
32. C
33. B
34. B