1. (1.5) Solve the inequality \( 9x - 5 < 6x + 1 \)
   (a) \( x < 2 \)  (d) \( x > \frac{2}{5} \)
   (b) \( x > 2 \)  (e) None of these
   (c) \( x < \frac{2}{5} \)

2. (1.5) The solution set of the inequality \( 0 < (x - 4)^{-1} < \frac{1}{2} \) is
   (a) \( (0, 2) \)  (d) \( (-\infty, 6) \)
   (b) \( (0, 6) \)  (e) \( (2, 3) \)
   (c) \( (6, \infty) \)

3. (1.5) The solution set of the inequality \( x(9x - 5) \leq (3x - 1)^2 \) is
   (a) \( (-\infty, 1] \)  (d) \( [1/5, \infty) \)
   (b) \( [1, \infty) \)  (e) \( \{0, 5/9, 1/3\} \)
   (c) the empty set

4. (1.6) Solve the inequality \( |x - 2| < 3 \)
   (a) \( -2 < x < 1 \)  (d) \( 0 < x < 1 \)
   (b) \( -2 < x < 5 \)  (e) None of these
   (c) \( 2 < x < 5 \)

5. (1.6 41) Solve the inequality \( |1 - 4x| - 7 < -2 \).
   (a) \( -\frac{3}{2} < x < 1 \)  (d) \( -1 < x < \frac{3}{2} \)
   (b) \( -\frac{3}{2} < x < -1 \)  (e) None of these
   (c) \( 1 < x < \frac{3}{2} \)

6. (1.6 Example 6) Solve the inequality \( |2x - 5| > 3 \).
   (a) \( x < 1 \) or \( x > 4 \)  (d) \( x < 4 \) \( \) and \( x > -1 \)
   (b) \( x < -1 \) or \( x > 4 \)  (e) None of these
   (c) \( x < 4 \) and \( x > 1 \)

7. (1.7 29) Trent can deliver his newspapers in 30 minutes. It takes Lois 20 minutes to do the same route. How long would it take them to deliver the newspapers if they work together?
   (a) 50 minutes  (d) 10 minutes
   (b) 25 minutes  (e) None of these
   (c) 12 minutes

8. (1.7) If \( x \) gallons of cherry juice costing $3.00 per gallon are to be combined with \( y \) gallons of apple juice costing $1.00 per gallon to make a fruit juice mix costing $2.50 per gallon, then what is \( \frac{x}{y} \)?
   (a) 3  (d) \( \frac{6}{5} \)
   (b) 10  (e) cannot be determined
   (c) \( \frac{1}{3} \)
9. (2.1) Find the distance between the points (2, 5) and (4, −3) in the plane.
   (a) $2\sqrt{2}$  (d) $2\sqrt{17}$
   (b) 10  (e) 68
   (c) $\sqrt{10}$

10. (2.1 38) Find all points on the $y$-axis that are 5 units from the point (4, 4).
   (a) $(-1, 0)$ and $(-7, 0)$  (d) $(0, -1)$ and $(0, -7)$
   (b) $(0, 5)$ and $(0, 5)$  (e) None of these
   (c) $(0, 1)$ and $(0, 7)$

11. (2.1) The midpoint of the line segment joining the points $(1, 6)$ and $(-3, 4)$ is
   (a) $(\frac{1}{2}, \frac{7}{2})$  (d) $(-2, -1)$
   (b) $(\frac{7}{2}, \frac{1}{2})$  (e) $(16, 4)$
   (c) $(-1, 5)$

12. (2.2) Find the $x$-intercepts of the graph of the equation $y - x^2 - 4 = 0$.
   (a) The $x$-intercepts are $\sqrt{2}$ and $-\sqrt{2}$  (d) The only $x$-intercept is 2
   (b) The only $x$-intercept is $-4$  (e) None of these
   (c) The $x$-intercepts are 2 and $-2$

13. (2.2) The graph of $y = \frac{x^3}{x^2 - 9}$ is symmetric with respect to
   (a) the $x$-axis and $y$-axis, but NOT the origin.
   (b) the origin, but NOT the $x$-axis or $y$-axis.
   (c) the $x$-axis and the origin, but NOT the $y$-axis.
   (d) the $y$-axis and origin, but NOT the $x$-axis.
   (e) the $x$-axis, the $y$-axis and the origin.

14. (2.3 19) The standard form of the equation of the circle with radius 6 and center $(-3, -6)$ is
   (a) $(x + 3)^2 + (y + 6)^2 = 36$
   (b) $(x - 3)^2 + (y - 6)^2 = 36$
   (c) $(x + 6)^2 + (y + 3)^2 = 36$
   (d) $(x - 6)^2 + (y - 3)^2 = 36$
   (e) None of these

15. (2.3) The graph of the equation $4x^2 + 9y^2 = 36$ has
   (a) $x$-intercept $(0, 0)$ and $y$-intercept $(0, 0)$
   (b) $x$-intercept $(3, 0)$ and $y$-intercept $(0, 2)$
   (c) $x$-intercept $(2, 0)$ and $y$-intercept $(0, 3)$
   (d) $x$-intercepts $(3, 0)$ and $(-3, 0)$ and $y$-intercepts $(0, 2)$ and $(0, -2)$
   (e) $x$-intercepts $(2, 0)$ and $(-2, 0)$ and $y$-intercepts $(0, 3)$ and $(0, -3)
16. (2.3) The graph of the equation \( x^2 + y^2 - 2x - 6y + 7 = 0 \) is
(a) a circle with center (3, 1) and radius 3.
(b) a circle with center (3, -1) and radius \( \sqrt{3} \).
(c) a circle with center (1, 3) and radius \( \sqrt{7} \).
(d) a circle with center (1, 3) and radius \( \sqrt{3} \).
(e) not a circle.

17. (2.4) The equation of the vertical line passing through the point (4, 7) is
(a) \( x = 4 \)
(b) \( x = 7 \)
(c) \( y = 4 \)
(d) \( y = 7 \)
(e) \( 4x = 7 \)

18. (2.4) Which of the following is an equation of the line passing through the point (5, -4) and parallel to the line with equation \( 3x - 5y + 2 = 0 \)?
(a) \( y = 3x - 4 \)
(b) \( y = 3x - 19 \)
(c) \( y = \frac{3}{5}x - 7 \)
(d) \( y = \frac{4}{5}x - 4 \)
(e) \( y = -\frac{5}{3}x - 9 \)

19. (2.4) The graph of the line with equation \( 3x - 5y + 2 = 0 \) has
(a) \( x \)-intercept \(-\frac{2}{3}, 0\) and \( y \)-intercept \(0, \frac{2}{5}\)
(b) \( x \)-intercept \(2/5, 0\) and \( y \)-intercept \(0, -2/3\)
(c) \( x \)-intercept \(3, 0\) and \( y \)-intercept \(0, -5\)
(d) \( x \)-intercept \(-5, 0\) and \( y \)-intercept \(0, 3\)
(e) \( x \)-intercept \(3/2, 0\) and \( y \)-intercept \(0, -5/2\)

20. (2.4) Find the slope of the line through the points \((-3, -1)\) and \((1, 7)\).
(a) 2
(b) \( \frac{1}{2} \)
(c) -3
(d) 3
(e) None of these

21. (2.4) Find an equation for the line through \((0, 3)\) and \((-2, 0)\).
(a) \( 2x - 3y + 6 = 0 \)
(b) \( 3x + 2y - 6 = 0 \)
(c) \( 3x - 2y + 6 = 0 \)
(d) \( 2x + 3y - 6 = 0 \)
(e) \( 3x + 2y + 6 = 0 \)

22. (2.4 Example 8) Find the slope \( m \) and \( y \)-intercept \( b \) of the equation \( 2x + 4y = 8 \).
(a) \( m = \frac{1}{2} \) and \( b = 2 \)
(b) \( m = -\frac{1}{2} \) and \( b = 2 \)
(c) \( m = 2 \) and \( b = 4 \)
(d) \( m = -2 \) and \( b = 4 \)
(e) None of these
23. (2.4) The graph of the line with equation $5x - 3y - 2 = 0$ has

(a) $x$-intercept $\left(-\frac{2}{3}, 0\right)$ and $y$-intercept $\left(0, \frac{2}{5}\right)$
(b) $x$-intercept $\left(\frac{2}{5}, 0\right)$ and $y$-intercept $\left(0, -\frac{2}{3}\right)$
(c) $x$-intercept $\left(3, 0\right)$ and $y$-intercept $\left(0, -5\right)$
(d) $x$-intercept $\left(-5, 0\right)$ and $y$-intercept $\left(0, 3\right)$
(e) $x$-intercept $\left(\frac{3}{2}, 0\right)$ and $y$-intercept $\left(0, -\frac{5}{2}\right)$

24. (2.5) The slope of a line perpendicular to the line with equation $2x - 5y + 3 = 0$ is

(a) $2$  (d) $-\frac{5}{2}$
(b) $\frac{2}{5}$  (e) not enough information to determine
(c) $\frac{5}{2}$

25. (2.5) The line which is perpendicular to the line given by $y = 4x - 3$ and which passes through the point $(0, 5)$ also passes through which of the following points?

(a) $(4, 0)$  (d) $(4, 6)$
(b) $(4, 13)$  (e) $(4, -11)$
(c) $(4, 4)$

26. (2.5 27) Find an equation for the line perpendicular to the line $2x + y = 2$ and containing the point $(-3, 0)$.

(a) $y = 2(x + 3)$  (d) $y = -\frac{1}{2}(x + 3)$
(b) $y = -2(x + 3)$  (e) None of these
(c) $y = \frac{1}{2}(x + 3)$

27. (3.1) Consider the function $f(x) = x^3 + x$. Find $f(-2)$.

(a) $6$  (d) $-10$
(b) $10$  (e) None of these
(c) $-6$

28. (3.1) Consider the function $f(x) = x^2 - 2$. Find $f(y + 2)$.

(a) $x^2y + 2x^2 - 2y - 4$  (d) $y^2 + 2$
(b) $y^2 + 4y + 2$  (e) None of these
(c) $y^2$

29. (3.1) Find the domain of the function $f(x) = \frac{x + 1}{x - 1}$.

(a) All real numbers except $x = -1$.
(b) All real numbers except $x = 1$ and $x = -1$.
(c) All real numbers except $x = 1$.
(d) All real numbers.
(e) None of these.
30. (3.1) What is the domain of the function \( f \) defined by \( f(x) = \frac{x + 2}{\sqrt{5 + 3x}} \)?

(a) \((-\infty, 0]\)  
(b) \((-\infty, 0)\)  
(c) \((-2, \infty)\)  
(d) \((-5/3, \infty)\)  
(e) \((-\infty, -5/3)\)

31. (3.1) What is the domain of the function \( G \) defined by \( G(x) = \frac{x - 3}{x^3 + 3x^2 - 10x} \)?

(a) all reals except 3  
(b) all reals except 2, -5, 0  
(c) all reals except 2, -5, 3, 0  
(d) \(\{2, -5, 3, 0\}\)  
(e) \(\{2, -5, 0\}\)

32. (3.1) If \( f(x) = \frac{2x + 1}{3x - 5} \), then what is \( f(3x + 1) \)?

(a) \(f(3x + 1) = 3 \cdot \left(\frac{2x + 1}{3x - 5}\right) + 1\)  
(b) \(f(3x + 1) = \frac{6x + 2}{9x - 4}\)  
(c) \(f(3x + 1) = \frac{6x + 3}{9x - 2}\)  
(d) \(f(3x + 1) = \frac{(2x + 1)(3x + 1)}{(3x - 5)}\)  
(e) none of the above

33. (see 3.1 28) Let \( f(x) = 2x^2 - 4 \). Find \( f(x - 3) \).

(a) \(2x^2 - 12x + 18\)  
(b) \(2x^2 - 12x + 14\)  
(c) \(2x^2 - 22\)  
(d) \(2x^2 + 14\)  
(e) None of these

34. (3.1 38) For \( f(x) = 2x^2 - 3x \), find and simplify the difference quotient \( \frac{f(x + h) - f(x)}{h} \), \( h \neq 0 \).

(a) \(2h + 3\)  
(b) \(2h - 3\)  
(c) \(4x + 2h + 3\)  
(d) \(4x + 2h - 3\)  
(e) None of these

35. (3.1 75) For the function \( f(x) = x^2 - x + 4 \), find the difference quotient \( \frac{f(x + h) - f(x)}{h} \), assuming that \( h \neq 0 \).

(a) \(h + 1\)  
(b) \(h - 1\)  
(c) \(2x + h + 1\)  
(d) \(2x + h - 1\)  
(e) None of these

36. (3.3 57) The function \( f(x) = \frac{-x^3}{3x^2 - 9} \) is

(a) Odd  
(b) Even  
(c) Neither odd nor even  
(d) Both odd and even  
(e) None of these
37. (3.3 44) For the function \( f(x) = \frac{1}{x^2} \), the equation of the secant line joining \((1, f(1))\) and \((2, f(2))\) is:

(a) \( y = -\frac{3}{4}x + \frac{7}{4} \)  
(b) \( y = -\frac{3}{4}x - \frac{7}{4} \)  
(c) \( y = \frac{3}{4}x + \frac{1}{4} \)  
(d) \( y = \frac{3}{4}x - \frac{5}{4} \)  
(e) None of these

38. (3.3) If \( f \) is an odd function and \((a, b)\) lies on the graph of \( f \), what other point(s) must also lie on the graph of \( f \)?

(a) \((-a, b)\)  
(b) \((a, -b)\)  
(c) \((-a, -b)\)  
(d) \((a, -b)\) and \((-a, b)\)  
(e) \((a, -b)\) and \((-a, -b)\)

39. (see 3.4 38) Find the \( x \)-intercept(s) and the \( y \)-intercept of the function

\[ f(x) = \begin{cases} 
3 + x & \text{if } -3 \leq x < 0 \\
2 & \text{if } x = 0 \\
\sqrt{x} - 1 & \text{if } 0 < x 
\end{cases} \]

(a) \( x = -3 \) and \( y = 2 \)  
(b) \( x = -3 \) and \( y = 3 \)  
(c) \( x = 3 \) and \( y = 2 \)  
(d) \( x = 3 \) and \( y = 3 \)  
(e) None of these

40. If \( f(x) = \begin{cases} 
x^2 & \text{if } x < 0 \\
2 & \text{if } x = 0 \\
2x + 1 & \text{if } 0 < x 
\end{cases} \), find \( f(x + 3) \) when \( x > 0 \).

(a) \( x^2 + 6x + 9 \)  
(b) \( x^2 + 6x + 10 \)  
(c) \( 2x + 6 \)  
(d) \( 2x + 7 \)  
(e) None of these

Note: The actual exam will have at most 20 questions. It will probably have 16 questions, like exam 1.