INSTRUCTIONS

1. DO NOT OPEN THIS EXAM UNTIL YOU ARE TOLD TO DO SO.

2. Carefully mark your student ID on your scantron.

3. This exam has 8 pages, including the cover sheet. There are 20 multiple-choice questions, worth 4 points each, and 3 workout questions, worth a total of 20 points. No partial credit will be given on the multiple choice questions.

4. You will have 60 minutes to complete this exam. No notes or books are allowed. TI-30Xa and TI-30XIIS scientific calculators are allowed. NO other calculators are allowed.

5. When you are finished, check your work carefully. Then, slide your scantron inside the exam packet before returning the exam to YOUR instructor.

USEFUL FORMULAS

- \( a^2 + b^2 = c^2 \), for a right triangle with hypotenuse \( c \) and sides \( a, b \).
- In a triangle \( ABC \), \( A + B + C = 180^\circ \)
- Perimeter of a Rectangle: \( P = 2l + 2w \)
- \( m = \frac{y_2 - y_1}{x_2 - x_1} \)
- \( y = mx + b \)
- \( y - y_1 = m(x - x_1) \)
MULTIPLE CHOICE. Mark your answers on the scantron. Partial credit will not be given.

1. Find the slope of the line $x - 2 = 0$.

   a) $1$
   b) $2$
   c) $0$
   d) $-2$
   e) Undefined

2. Determine whether the ordered pair $(-3, -15)$ is a solution to $y = 3x - 6$.

   a) Yes
   b) No
   c) Cannot be determined

3. Find the slope of the line whose graph is shown.

   a) $\frac{1}{3}$
   b) $-3$
   c) $-\frac{1}{3}$
   d) $3$
   e) $\frac{1}{2}$

4. Find the $x$-intercept of the line $5y - 2x + 5 = 0$

   a) $\left(\frac{5}{2}, 0\right)$
   b) $\left(-\frac{5}{2}, 0\right)$
   c) $(0, \frac{5}{2})$
   d) $(-1, 0)$
   e) $(0, -1)$
5. Determine whether the following relation represents a function: \{(8, 2), (6, -9), (3, 3), (7, 2), (5, 0)\}

(a) Yes  
(b) No  
(c) Cannot be determined

6. Which of the following graphs below represent functions?

Graph I  
Graph II  
Graph III  
Graph IV

(a) I and II  
(b) II and III  
(c) III and IV  
(d) I and III  
(e) None

7. Find the slope of the line passing through the points (9, -4) and (8, -4).

(a) -8  
(b) 0  
(c) \(\frac{1}{8}\)  
(d) \(-\frac{1}{8}\)  
(e) Undefined

8. Determine whether the lines are parallel, perpendicular, or neither: \(-3x - 2y = 8\) and \(3x - 2y = 5\)

(a) Parallel  
(b) Perpendicular  
(c) Neither
9. Determine the range of the relation whose graph is shown.

a. \((-6, 8]\)

b. \([-6, 4])

c. \((-6, -4])

d. \((4, 8]\)

e. \((-\infty, \infty))

10. Find the y-intercept of the line \(-x - 2y = -18\).

a. \((0, -18)\)

b. \((0, 18)\)

c. \((0, 9)\)

d. \((0, -9)\)

e. None of the above

11. Find the slope of the line parallel to the line \(5x - 2y = 8\).

a. \(-\frac{5}{2}\)

b. \(\frac{5}{2}\)

c. \(-\frac{2}{5}\)

d. 5

e. Undefined

12. Find the equation of the line through the point \((-5, -1)\) and perpendicular to the line \(y = 0\).

a. \(y = -1\)

b. \(y = -5\)

c. \(x = -1\)

d. \(x = -5\)

e. \(y = \frac{1}{5}\)
13. Determine whether $(3, -5)$ is a solution of the system of equations:
\[
\begin{align*}
    x - y &= 8 \\
    4x - 3y &= 27
\end{align*}
\]
(a) Yes  
(b) No  
(c) Cannot be determined

14. Find the slope of the line perpendicular to the line $4x - 3y = 12$.
(a) $-\frac{4}{3}$  
(b) $\frac{3}{4}$  
(c) 0  
(d) $-\frac{3}{4}$  
(e) $\frac{4}{3}$

15. Solve the system of equations:
\[
\begin{align*}
    x - 3y &= 18 \\
    4x - 12y &= 18
\end{align*}
\]
(a) $(3, -5)$  
(b) $(0, -6)$  
(c) $(6, -4)$  
(d) Infinitely many solutions  
(e) No solutions

16. Find the equation of the line through the point $(5, -4)$ and parallel to the line $y = \frac{2}{5}x + 6$.
(a) $y = \frac{2}{5}x - 6$  
(b) $y = \frac{2}{5}x + \frac{33}{5}$  
(c) $y = -\frac{5}{2}x + \frac{17}{2}$  
(d) $y = -\frac{2}{5}x - 4$  
(e) $y = -\frac{5}{2}x + 6$
17. One number is five less than a second number. Three times the first is 11 more than 5 times the second. Find the second number.

   a) −13
   b) 13
   c) 18
   d) −18
   e) −7

18. Find the equation of the line through the points (5, −4) and (−3, −8).

   a) \( y = -2x - 3 \)
   b) \( y = -\frac{1}{2}x + \frac{3}{2} \)
   c) \( y = \frac{1}{2}x - \frac{3}{2} \)
   d) \( y = x - 13 \)
   e) \( y = \frac{1}{2}x - \frac{13}{2} \)

19. Find the \( y \)-intercept of the line through the point (5, 4) and parallel to the line \( y = 2x + 3 \).

   a) (0, 13)
   b) (0, −6)
   c) (0, 14)
   d) (0, 3)
   e) (0, −3)

20. Solve the system of equations:
\[
\begin{align*}
2x + 4y &= -6 \\
x &= 2y - 5
\end{align*}
\]

   a) \((-4, \frac{1}{2})\)
   b) \((-2, -\frac{1}{2})\)
   c) \((-1, 2)\)
   d) Infinitely many solutions
   e) No solutions
21. (9 points) At a concession stand, four hot dogs and three cheeseburgers cost $8.50; two hot dogs and five cheeseburgers cost $9.50. Find the cost of one hot dog and the cost of one cheeseburger.

(a) Set up a system of equations that can be used to solve the problem. Clearly identify your variables.

(b) Solve the system of equations.

(c) The cost of one hot dog is _________________

(d) The cost of one cheeseburger is _________________
22. (4 points) Given the function \( f(x) = -7x - 8 \), find and simplify:

(a) \( f(-5) \)

(b) \( f(-a) \)

(c) \( f(b + 3) \)

23. (7 points) Write the equation for a line that passes through \((4, -3)\) and is perpendicular to the line \(4x + 5y = 9\).

(a) Find the slope of the given line.

(b) Write the equation of the line in the form \( y = mx + b \).