Name:_____

Student ID:_____

Section:_____

Instructor: Dr. Dang

Math 1314 (College Algebra)
Practice Test 2

Instructions:

- I strongly suggest you only use a scientific calculator such as the TI-30X IIS when you work on this practice exam because you will only be allowed a scientific calculator for the actual exam. Sophisticated calculators and computational tools such as graphing calculators or Wolfram Alpha will hinder the goal of this practice exam, which is a drill to prepare you for the actual exam.
- Simplify your answers as much as possible. Expressions such as $\ln(1)$, e^0, $\sin(\pi/2)$, etc. must be simplified for full credit.
- For questions 16 to 20, show all your work in the space provided. justifying your answer.
- **Please write neatly.**
- Simplify your answers as much as possible.

For Instructor use only.

#	Possible	Earned
MC	60	
16	10	
17	5	
Sub	75	

#	Possible	Earned
18	10	
19	5	
20	10	
Sub	25	
Total	100	

Multiple Choice. Circle the correct answer for each question. Circle one choice only.

1. (Section 2.3) Find the slope of the line that goes through the points $(7, -6)$ and $(-4, -18)$.

   a) $\frac{12}{11}$ b) $\frac{11}{12}$ c) $-\frac{12}{11}$

   d) $-\frac{11}{12}$ e) -8 f) 8

2. (Section 2.3) The average value of a certain type of automobile was $\$15,300$ in 1993 and depreciated to \$6840 in 1996. Let y be the average value of the automobile in the year x, where $x = 0$ represents 1993. Write a linear equation that models the value of the automobile in terms of the year x.

   a) $y = -2820x + 15,300$ b) $y = -2820x - 15,300$

   c) $y = -2820x + 6840$ d) $y = -2820x - 6840$

   e) $y = -\frac{1}{2820}x - 6840$ f) $y = -\frac{1}{2820}x - 15,300$

3. (Section 2.3) Determine the slope and the y-intercept of the graph of the equation $-x + 6y - 42 = 0$

   a) $m = \frac{1}{6}; (0, 7)$ b) $m = -\frac{1}{6}; (0, 7)$ c) $m = -6; (0, 7)$

   d) $m = -1; (0, 42)$ e) $m = 6; (0, -42)$ f) $m = -6; (0, -42)$

4. (Section 2.4) Find the slope-intercept form of the line passing through $(5, 3)$ and perpendicular to the line whose equation is $y = \frac{1}{7}x + 5$.

   a) $y = -7x + 38$ b) $y = 7x - 38$ c) $y = -7x - 38$

   d) $y = -\frac{1}{7}x + 38$ e) $y = -\frac{1}{7}x - 38$ f) $y = \frac{1}{7}x - 38$

5. (Section 2.4) Find the average rate of change of the function $f(x) = -3x^2 - x$ from $x_1 = 5$ to $x_2 = 6$.

   a) -34 b) -2 c) 2

   d) $\frac{1}{2}$ e) $-\frac{1}{6}$ f) $\frac{1}{6}$

6. (Section 2.5) The graph of the function $f(x)$ undergoes two successive transformations. The equation of the transformed graph is $g(x) = |x + 2| + 3$. What are the two transformations?

a) Shift to the left 2 units and shift up 3 units.

b) Shift to the left 3 units and shift up 2 units.

c) Shift to the right 2 units and shift up 3 units.

d) Shift to the right 3 units and shift up 2 units.

7. (Section 2.5) The graph of the function $f(x)$ undergoes three successive transformations. The equation of the transformed graph is $g(x) = -2f(3x)$. What are the three transformations?

a) Stretch horizontally, stretch vertically, reflect across the x-axis.

b) Shrink horizontally, stretch vertically, reflect across the x-axis.

c) Stretch horizontally, shrink vertically, reflect across the x-axis.

d) Shrink horizontally, stretch vertically, reflect across the y-axis.

e) Stretch horizontally, shrink vertically, reflect across the y-axis.

f) Stretch horizontally, stretch vertically, reflect across the x-axis.

8. (Section 2.6) Find the domain of the function

$$\frac{x}{\sqrt{x-10}}.$$

a) $(10, \infty)$ b) $[10, \infty)$ c) $(-\infty, 10) \cup (10, \infty)$

d) $(0, 10)$ e) $(-\infty, 0) \cup (0, 10) \cup (10, \infty)$ f) $(-\infty, \infty)$

9. (Section 2.6) Let $f(x) = x^2 - 2x + 4$ and $g(x) = x^2 - 2x + 3$. Find $(f \circ g)(3)$

a) 41 b) 28 c) 35

d) 39 e) 26 f) 45

10. (Section 2.6) Let $f(x) = 5x + 8$ and $g(x) = 2x - 1$. Find $f \circ g(x)$.

a) $10x + 15$ b) $10x + 13$ c) $10x + 11$

d) $10x + 3$ e) $10x + 5$ f) $10x + 7$

11. (Section 2.7) Determine which two functions are inverses of each other.

$$f(x) = \frac{x+4}{2}, g(x) = 2x + 4, h(x) = \frac{x-2}{4}.$$

a) f and g b) f and h c) g and h

d) None of the above

12. (Section 2.7) Find the inverse of the function $f(x) = \sqrt[3]{x-3}$.

a) $f^{-1}(x) = x^3 + 3$ b) $f^{-1}(x) = \dfrac{1}{x^3+3}$ c) $f^{-1}(x) = x^3 + 9$

d) $f^{-1}(x) = x^3 + 27$ e) $f^{-1}(x) = \dfrac{1}{x^3} - 3$ f) $f^{-1}(x) = \dfrac{1}{x^3} + 3$

13. (Section 2.8) Find the distance between the points $(2, -5)$ and $(6, -3)$.

a) $2\sqrt{5}$ b) $5\sqrt{5}$ c) $4\sqrt{3}$

d) $12\sqrt{3}$ e) 12 f) 2

14. (Section 2.8) Find the midpoint of the line segment whose endpoints are $(5, -4)$ and $(7, -1)$.

a) $(-2, -3)$ b) $(12, -5)$ c) $(6, -\dfrac{3}{2})$

d) $(-1, -\dfrac{3}{2})$ e) $(6, -\dfrac{5}{2})$ f) $(1, -\dfrac{5}{2})$

15. (Section 2.8) Find the center and the radiuys of the circle

$$(x+2)^2 + (y-6)^2 = 81$$

a) $(-2, 6), r = 9$ b) $(2, -6), r = 81$ c) $(6, -2), r = 9$

d) $(-6, 2), r = 81$ e) $(2, -6), r = 81$ f) $(6, -2), r = 81$

Free response: Show all work in the space provided. Full credit will be given only if all steps are shown justifying your answer. Please write neatly and carefully, if I cannot read your handwriting, you will receive NO credit. Scratch work will not be graded.

16. (10 points) (Section 2.3 and 2.4)

    (a) Write an equation in slope-intercept form for the line passing through $(-8, -3)$ and $(-4, -8)$.

    (b) Write an equation in slope-intercept form for the line passing through $(4, 2)$ and parallel to the line whose equation is $4x + y - 6 = 0$.

17. (5 points) (Section 2.5) Use the graph of $y = f(x)$ to graph the function $g(x) = -2f(x-2)$ in the same coordinate axes.

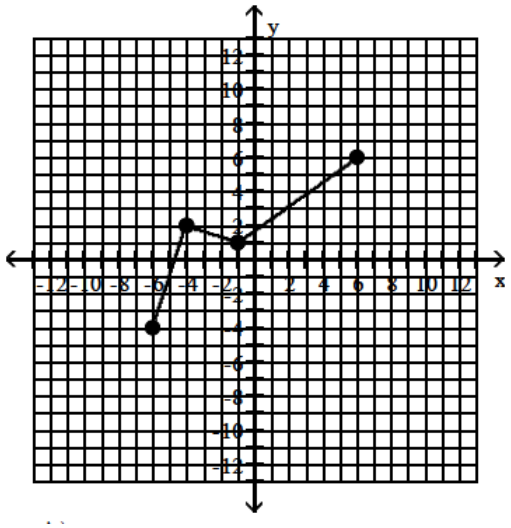

Figure 1: Figure for Question 17

18. (10 points) (Section 2.6) Let $f(x) = \dfrac{8}{x+8}$ and $g(x) = \dfrac{8}{x}$.

(a) Find $(f \circ g)(x)$

(b) Find the domain of the composite function $f \circ g$.

19. (5 points) (Section 2.7) Find the inverse function of the function $f(x) = \dfrac{7}{3x-1}$

20. (10 points) (Section 2.8)

(a) Complete the square and write the equation of the circle in standard form.

$$x^2 + y^2 + 4x + 10y = 7.$$

(b) Give the center and radius of the circle in part (a). Graph the circle.

END OF EXAM