EAST LOS ANGELES COLLEGE **NAME:**

MATH 125 (INTERMEDIATE ALGEBRA)SAMPLE FINAL EXAM
INSTRUCTOR: ANNE SISWANTO; TOTAL POINTS: 200; TIME: 120 MINUTES.

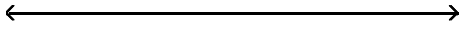
Direction: Please write your answer in the answer blanks and show all work to get full credits. No graphing calculator can be used.

(5 POINTS) Solve and graph. Write the solution in interval notation.

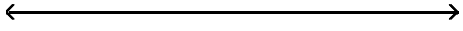
1) $4x - 2 < -22$ and $6 - 5x > 26$ 1) _____

(6 POINTS) Solve and graph. Write the solution in interval notation.

2) $4 - |4 - 4x| > -3$ 2) _____



3) $2|z + 2| + 2 \geq 15$ 3) _____



(4 POINTS) Solve the system of equations using substitution.

4) $\begin{cases} x - 4y = -24 \\ -7x - 5y = 3 \end{cases}$ 4) _____

(4 POINTS) Solve the system of equations using the elimination method.

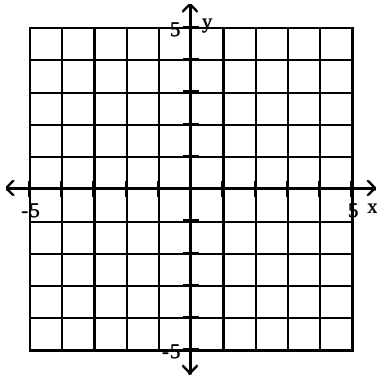
5) $\begin{cases} 8x + 4y = -20 \\ -5x + 2y = -10 \end{cases}$ 5) _____

(8 POINTS) Solve using Cramer's Rule or substitution.

6) $\begin{cases} x - y + 3z = 19 \\ 2x + z = 5 \\ x + 3y + z = -7 \end{cases}$ 6) _____

(6 POINTS) Graph the solution of the system. Label at least two points on each line.

7) $\begin{cases} x + 2y \geq 2 \\ x - y \leq 0 \end{cases}$ 7) _____



(3 POINTS) Simplify the radicals and then find the sum or difference.

8) $-10\sqrt{72} + 7\sqrt{200} + 4\sqrt{98}$ 8) _____

(3 POINTS) Multiply using FOIL.

9) $(3\sqrt{3} + 4\sqrt{17})(4\sqrt{2} + 3\sqrt{5})$ 9) _____

(3 POINTS) Rationalize the denominator and simplify.

10) $\dfrac{15}{\sqrt{13}}$ 10) _____

(4 POINTS) Rationalize the denominator and simplify.

11) $\dfrac{\sqrt{7}}{7\sqrt{6} - \sqrt{7}}$ 11) _____

(3 POINTS) Multiply.

12) $(2 - 8i)(6 + 6i)$ 12) _____

(4 POINTS) Write the quotient in standard form.

13) $\frac{8 + 2i}{3 - 7i}$ 13) _____

(5 POINTS) Solve.

14) $(2m - 1)^2 = -9$ 14) _____

(7 POINTS) Solve the equation by completing the square.

15) $p^2 + 3p - 9 = 0$ 15) _____

16) $x^2 - 10x + 61 = 0$ 16) _____

(7 POINTS) Solve using the quadratic formula.

17) $8x^2 + 7x = -2$ 17) _____

(7 POINTS) Solve the equation and state the solutions.

18) $\frac{16}{x+2} = 1 + \frac{2}{x-4}$ 18) _____

19) $\sqrt{x+7} + 5 = x$ 19) _____

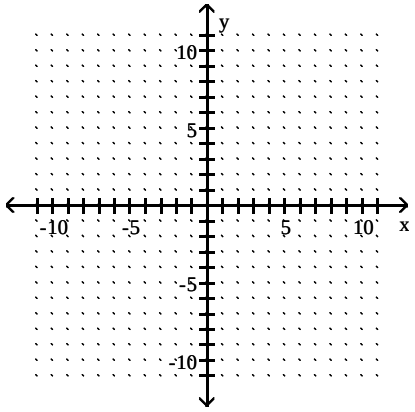
(7 POINTS) Solve.

20) $x^4 - 3x^2 - 4 = 0$ 20) _____

(8 POINTS)

a. State whether the graph opens up or down
b. Find the coordinate of the vertex
c. Find the equation of the axis of symmetry
d. Use additional points , graph, and label at least 5 points.

21) $g(x) = -x^2 + 2x + 1$ 21) _____



(6 POINTS) Solve the inequality, graph the solution set, and write the solution using interval notation.

22) $x^2 + 2x < 3$ 22) _____

(8 POINTS) Solve the inequality, graph the solution set, and write the solution using interval notation.

23) $\frac{3x}{-5x + 17} \geq 3$ 23) _____

(5 POINTS) Find the indicated composition.

24) $f(x) = 2\sqrt{x + 9}$; $g(x) = 5x + 7$ 24) _____
Find $(f \circ g)(x)$.

(5 POINTS) Find $f^{-1}(x)$ for the following one–to–one function f.

25) $f(x) = \frac{x - 10}{x + 8}$ 25) _____

(4 POINTS) Solve.

26) $\log_x 625 = 4$ 26) _____

(4 POINTS) Solve the exponential equation.

27) $e^{-0.19t} = 0.15$ 27) _____

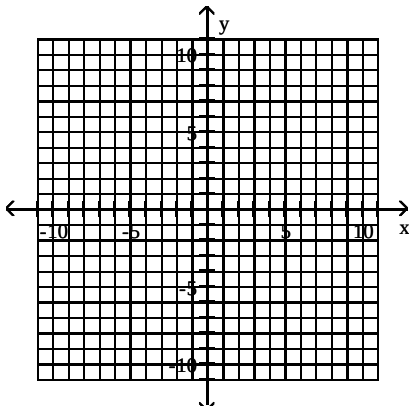
(6 POINTS) Solve the logarithmic equation.

28) $\log (3 + x) - \log (x - 5) = \log 5$ 28) _____

29) $\log (x + 9) = 1 - \log x$ 29) _____

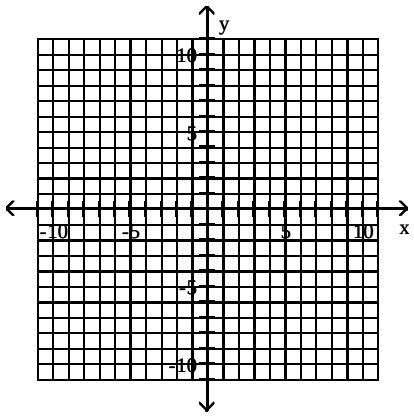
(7 POINTS) Find the center and radius and draw the graph. Label at least 5 points on the graph

30) $x^2 + y^2 + 6x + 4y + 9 = 0$ 30) _____



(5 POINTS) Graph the ellipse. Give the points above, below, to the left, and to the right of the center.

31) $\frac{(x-4)^2}{9}+\frac{(y-3)^2}{16}=1$ 31) _____



(8 POINTS) Solve the system of equations.

32) $\begin{cases} y = 10x - x^2 \\ 2x - y = -15 \end{cases}$ 32) _____

33) $\begin{cases} 3x^2 - 2y^2 = -2 \\ 2x^2 + 2y^2 = 82 \end{cases}$ 33) _____

(8 POINTS) Translate the problem to a system of equations, then solve using substitution or elimination method.

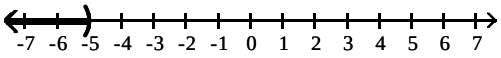
34) A shopkeeper ordered a total of 70 lb of cashews and peanuts. If he ordered 42 less pounds of cashews than peanuts, then how many pounds of peanuts did he order? 34) _____

(6 POINTS) Compute the compound interest.

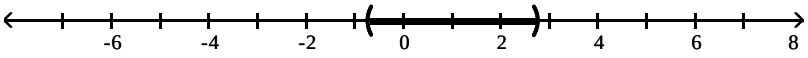
35) How long will it take for $500 to grow to $3200 at an interest rate of 9.8% if the interest is compounded continuously? Round the number of years to the nearest hundredth. 35) _____

Answer Key
Testname: M125FINS

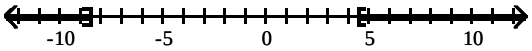
1) $(-\infty, -5)$



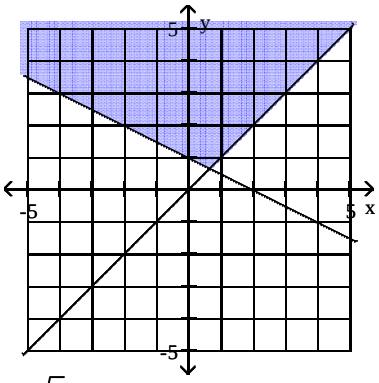
2) $\left(-\frac{3}{4}, \frac{11}{4}\right)$



3) $\left(-\infty, -\frac{17}{2}\right] \cup \left[\frac{9}{2}, \infty\right)$



4) $(-4, 5)$
5) $(0, -5)$
6) $(0, -4, 5)$
7)

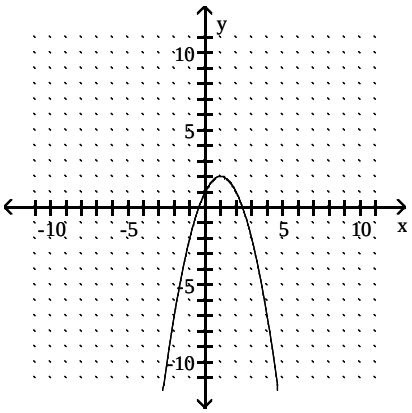


8) $38\sqrt{2}$
9) $12\sqrt{6} + 9\sqrt{15} + 16\sqrt{34} + 12\sqrt{85}$
10) $\frac{15\sqrt{13}}{13}$
11) $\frac{1}{41}(\sqrt{42} + 1)$
12) $60 - 36i$
13) $\frac{5}{29} + \frac{31}{29}i$
14) $\frac{1 \pm 3i}{2}$
15) $\frac{-3 \pm 3\sqrt{5}}{2}$
16) $5 \pm 6i$
17) $\frac{-7 \pm i\sqrt{15}}{16}$
18) 6, 10

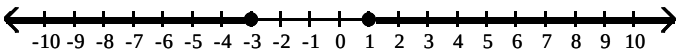
19) 9

20) ±2, ±i

21)



22) $(-\infty, -3] \cup [1, \infty)$



23) $\left[\frac{17}{6}, \frac{17}{5}\right)$

24) $(f \circ g)(x) = 2\sqrt{5x + 16}$

25) $f^{-1}(x) = \frac{-8x - 10}{x - 1}$

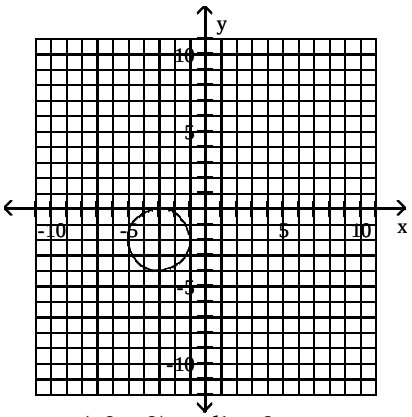
26) 5

27) 9.9848

28) 7

29) 1

30)



center (–3, –2); radius 2

Answer Key
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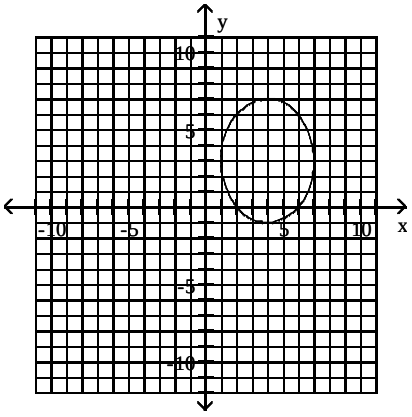
31)



(1, 3), (7, 3), (4, 7), (4, –1)

32) (5, 25), (3, 21)

33) (4, 5), (–4, 5), (4, –5), (–4, –5)

34) 56 lb

35) 18.94 yr