

Integrated III**Review Guide #2 for Exam #1**

Name: _____

Solve the equation.

1) $\log_5 (x + 1) = 1 + \log_5 (x - 2)$

2) $\log_3 (x - 4) = 1$

3) $\log_3 (x + 4) + \log_3 (x - 2) = 3$

4) $2^{(3x - 7)} = 4$

5) $4^1 + 2^x = 1024$

6) $9^{2x} \cdot 27^{(3 - x)} = \frac{1}{9}$

7) $e^{x + 7} = 2$

Solve the problem.

8) $f(x) = \log_2(x - 4)$ and $g(x) = \log_2(3x + 14)$.

Solve $f(x) + g(x) = 6$.

9) The formula $A = 287e^{0.034t}$ models the population of a particular city, in thousands, t years after 1998. When will the population of the city reach 377 thousand?**Solve.**10) The value of a particular investment follows a pattern of exponential growth. In the year 2000, you invested money in a money market account. The value of your investment t years after 2000 is given by the exponential growth model $A = 7600e^{0.066t}$. When will the account be worth \$9896?**Solve the problem.**11) The value of a particular investment follows a pattern of exponential growth. In the year 2000, you invested money in a money market account. The value of your investment t years after 2000 is given by the exponential growth model $A = 6600e^{0.062t}$. How much did you initially invest in the account?12) The size P of a small herbivore population at time t (in years) obeys the function $P(t) = 1000e^{0.25t}$ if they have enough food and the predator population stays constant. After how many years will the population reach 3000?**Find an equation for the line with the given properties.**13) Perpendicular to the line $y = -3x - 4$; containing the point $(4, -3)$ **Write the expression in the standard form $a + bi$.**

14) $(5 + 8i)(7 + 8i)$

Find the standard form and the center of the ellipse.

15) $4x^2 + 5y^2 - 56x + 50y + 301 = 0$

Form a polynomial whose zeros and degree are given. Hint: Write in factored form then multiply.

16) Zeros: $-3, -2, 2$; degree 3

Use the quadratic formula to solve the equation.

17) $x^2 + 10x + 3 = 0$

Solve the problem.

18) The owner of a video store has determined that the profits P of the store are approximately given by

$P(x) = -x^2 + 120x + 70$, where x is the number of videos rented daily. Find the maximum profit to the nearest dollar (Hint: Find the y value of the vertex).

Solve the system of equations by using substitution.

19)
$$\begin{cases} x + 7y = -2 \\ 3x + y = 34 \end{cases}$$

Use the elimination method to solve the system.

20)
$$\begin{cases} 9x + 36y = 36 \\ 8x - 6y = -6 \end{cases}$$

21) *Solve:*

$$\begin{aligned} 4x^2 + 6y^2 - 55x + 3y + 126 &= 0 \\ x - y &= 4 \end{aligned}$$

Solve the systems of equations problem by the elimination method.

22) There were 33,000 people at an All Things Sacred Concert in Los Angeles. The day's receipts were \$261,000. How many people paid \$13 for reserved seats and how many paid \$5 for general admission?

23) *Solve:*

$$\begin{aligned} -x^2 + y^2 + 6x - 10y - 8 &= 0 \\ x^2 - y^2 - 6x + 21y - 102 &= 0 \end{aligned}$$

Solve the equation. Use natural logarithms. When appropriate, give solutions to three decimal places unless otherwise indicated.

24) $e^{0.451x} = 24$

25) $e^{-0.358x} = 23$

Solve the equation. Give the exact solution or solutions.

26) $\log_9(x - 3) + \log_9(x - 3) = 1$

27) $\log_3(x + 6) + \log_3(x - 6) = 1$

28) $\log(6x - 5) = \log 25 - \log(x - 5)$

Answer Key

Testname: REVIEW GUIDE #2 FOR EXAM #1

- 1) $\left\{\frac{11}{4}\right\}$
- 2) $\{7\}$
- 3) $\{5\}$
- 4) $\{3\}$
- 5) $\{2\}$
- 6) $\{-11\}$
- 7) $\{\ln 2 - 7\}$
- 8) $\{6\}$
- 9) 2006
- 10) 2004
- 11) \$6600.00
- 12) 4.39 yrs
- 13) $y = \frac{1}{3}x - \frac{13}{3}$
- 14) $-29 + 96i$
- 15) $\frac{(x-7)^2}{5} + \frac{(y+5)^2}{4} = 1$ and center: $(7, -5)$
- 16) $f(x) = x^3 + 3x^2 - 4x - 12$
- 17) $\{-5 \pm \sqrt{22}\}$
- 18) \$3670
- 19) $x = 12, y = -2$
- 20) $x = 0, y = 1$
- 21) $(7, 3), (3, -1)$
- 22) 12,000 paid \$13 and 21,000 paid \$5
- 23) $(4, 10), (2, 10)$
- 24) $\{7.047\}$
- 25) $\{-8.758\}$
- 26) $\{6\}$
- 27) $\{\sqrt{39}\}$
- 28) $\left\{\frac{35}{6}\right\}$