Algebra 2 Name_____

Review Guide for Final Exam Part 1 and 2

Date_____ Period____

Solve each equation.

1) $\sqrt{-80 + 18x} = x$

2) $n = \sqrt{48 - 2n}$

3) $\log_{20} x = \log_{20} (2x - 1)$

4) $\log_3 -2n = \log_3 (-n - 3)$

5) $2^{a+2} = 32$

6) $64^{-2n} = \frac{1}{4}$

7) $e^{n-2} + 5 = 37$

8) $7 \cdot 10^{k-7} = 96$

9) $\frac{n+1}{5n} = 1 + \frac{n+2}{5n}$

10) $\frac{5n - 20}{4n^2} = \frac{1}{n^2} + \frac{n-1}{n^2}$

11) $\log_6 36 = \text{x}$

12) $\log_6 216 = \text{x}$

13) $4 + 9\left|-3 + x\right| = 112$

14) $3\left|8b\right| - 5 = 115$

15) $\log_2 2x^2 - \log_2 9 = 1$

16) $\log_2 (x + 4) + \log_2 x = 5$

17) $-b + \sqrt{2b - 3} = -1$

18) $n = 4 + \sqrt{6n - 29}$

19) Kimi invests $8,000 at 4% interest compounded continously. How much money will she have in 5 years?

20) Ashleigh purchased an air cooler for $12,000 in the year 1998. Its value depreciates by 9% each year. What is the value of the air cooler in 2006?

21) A plane traveled 1000 miles to Jacksonville and back. The trip there was with the wind. It took 10 hours. The trip back was into the wind. The trip back took 20 hours. What is the speed of the plane in still air? What is the speed of the wind?

22) A plane traveled 528 miles to Albuquerque and back. The trip there was with the wind. It took 6 hours. The trip back was into the wind. The trip back took 12 hours. What is the speed of the plane in still air? What is the speed of the wind?

23) A boat traveled 378 miles downstream and back. The trip downstream took 14 hours. The trip back took 42 hours. Find the speed of the boat in still water and the speed of the current.

Solve each system by elimination. Solve for x only.

24) $-6x + 5y - 4z = 10$
$3x - y + 3z = -2$
$-3x - 2y - 5z = -4$

25) $-5x - 2y + 5z = -1$
$-5x + 6y + z = 11$
$-2x + 2y + 2z = 8$

Evaluate each infinite geometric series described.

26) $6 - \frac{3}{2} + \frac{3}{8} - \frac{3}{32}...$

27) $-16 - 8 - 4 - 2...$

Solve each system by elimination. Solve for x only.

28) $4x + 9y = -15$
$-5x - 10y = 20$

29) $10x + 10y = -7$
$9x + 9y = -9$

Condense to a single logarithm.

30) $\frac{\log_5 u}{2} + \frac{\log_5 v}{2} + \frac{\log_5 w}{2}$

31) $5\log_5 3 - 30\log_5 2$

Expand the logarithm.

32) $\log_4 \left(\frac{3}{7^4}\right)^5$

33) $\log_7 \left(z^2 \sqrt[3]{x}\right)$

Find the common difference, the term named in the problem, and the explicit formula.

34) 23, 123, 223, 323, ...
Find a_{20}

35) 39, 42, 45, 48, ...
Find a_{24}

Find the common ratio, the 8th term, and the explicit formula.

36) 4, 8, 16, 32, ...

37) 1, 3, 9, 27, ...

Sketch the solution to each system of inequalities.

38) $2x - 3y \le -3$
$2x - y \le 3$

39) $x + 2y \ge -4$
$2x + y < 1$

Identify the center, vertices, and foci of each.

40) $9x^2 + 25y^2 + 90x + 100y - 575 = 0$

41) $49x^2 + 36y^2 + 490x - 539 = 0$

Identify the center and radius of each.

42) $x^2 + y^2 - 2x\sqrt{249} - 26y + 409 = 0$

43) $x^2 + y^2 + 32x + 32y + 511 = 0$

Identify the vertices and foci of each.

44) $9x^2 - y^2 - 108x + 12y + 207 = 0$

45) $25x^2 - 9y^2 + 425x + 153y + 256 = 0$

Solve each inequality and graph its solution.

46) $10 - 10\left|7 + 10x\right| > -20$

47) $\left|4m - 1\right| - 8 \ge -7$

Simplify each expression.

48) $6b + \frac{3a}{20b}$

49) $\frac{4v}{6v^3} + \frac{u + 6v}{4v}$

50) $\frac{\frac{4}{x} - \frac{x}{4}}{4}$

51) $\frac{\frac{9}{5} - \frac{25}{x^2}}{\frac{5}{x^2}}$

52) $\frac{r - 7}{8} \cdot \frac{2r + 16}{2}$

53) $\frac{10n + 70}{10} \cdot \frac{1}{n + 6}$

Perform the indicated operation.

54) $h(a) = a + 2$
$g(a) = a^2 + 5$
Find $(h + g)(a)$

55) $g(x) = -x^3 + 5$
$h(x) = x - 4$
Find $(g + h)(x)$

56) $f(n) = 2n + 1$
$g(n) = 3n - 4$
Find $f(1) \cdot g(1)$

57) $g(n) = -n + 1$
$h(n) = 2n^2 - n$
Find $g(-2) \cdot h(-2)$

58) $f(t) = t^2 + 1$
$g(t) = 2t - 2$
Find $f(g(0))$

59) $f(x) = 2x + 1$
$g(x) = x^3 + 3x$
Find $(f \circ g)(4)$

Find the reference angle.

60) $-325°$

61) $320°$

Convert the degree measure into radians.

62) $50°$

63) $225°$

Convert the radian measure into degrees.

64) $\frac{\pi}{3}$

65) $\frac{71\pi}{36}$

Find the exact value of each trigonometric function.

66) $\sin 360°$

67) $\sin -315°$

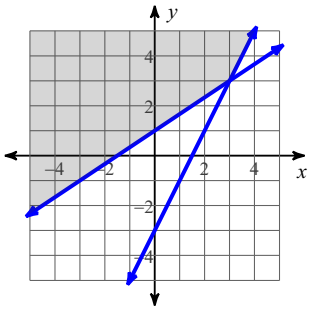
68) $\cos 960°$

69) $\cos -135°$

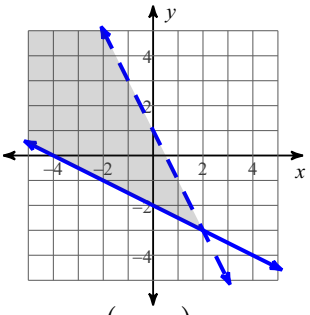
70) $\cos -810°$

Answers to Review Guide for Final Exam Part 1 and 2

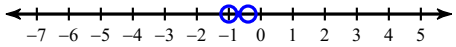
1) $\{8, 10\}$
2) $\{6\}$
3) $\{1\}$
4) No solution.
5) $\{3\}$
6) $\left\{\frac{1}{6}\right\}$
7) 5.4657
8) 8.1372
9) $\left\{-\frac{1}{5}\right\}$
10) $\{20\}$
11) 2
12) 3
13) $\{15, -9\}$
14) $\{5, -5\}$
15) $\{3, -3\}$
16) $\{4\}$
17) $\{2\}$
18) $\{9, 5\}$
19)
20)
21) plane: 75 mph, wind: 25 mph
22) plane: 66 mph, wind: 22 mph
23) boat: 18 mph, current: 9 mph
24) Infinitely many solutions
25) $x = 2$
26) $\frac{24}{5}$
27) -32
28) -6
29) No solution
30) $\log_5 \sqrt{wvu}$
31) $\log_5 \frac{3^5}{2^{30}}$
32) $5\log_4 3 - 20\log_4 7$
33) $2\log_7 z + \frac{\log_7 x}{3}$
34) Common Difference: $d = 100$
$a_{20} = 1923$
Explicit: $a_n = -77 + 100n$
35) Common Difference: $d = 3$
$a_{24} = 108$
Explicit: $a_n = 36 + 3n$
36) Common Ratio: $r = 2$
$a_8 = 512$
Explicit: $a_n = 4 \cdot 2^{n-1}$
37) Common Ratio: $r = 3$
$a_8 = 2187$
Explicit: $a_n = 3^{n-1}$
38)



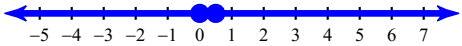
39)



40) Center: $(-5, -2)$
Vertices: $(5, -2), (-15, -2)$
Foci: $(3, -2), (-13, -2)$
41) Center: $(-5, 0)$
Vertices: $(-5, 7), (-5, -7)$
Foci: $(-5, \sqrt{13}), (-5, -\sqrt{13})$
42) Center: $(\sqrt{249}, 13)$
Radius: 3
43) Center: $(-16, -16)$
Radius: 1
44) Vertices: $(9, 6), (3, 6)$
Foci: $(6 + 3\sqrt{10}, 6), (6 - 3\sqrt{10}, 6)$
45) Vertices: $\left(-\frac{5}{2}, \frac{17}{2}\right), \left(-\frac{29}{2}, \frac{17}{2}\right)$
Foci: $\left(\frac{4\sqrt{34} - 17}{2}, \frac{17}{2}\right), \left(\frac{-4\sqrt{34} - 17}{2}, \frac{17}{2}\right)$
46) $-1 < x < -\frac{2}{5}$:



47) $m \geq \frac{1}{2}$ or $m \leq 0$:



48) $\dfrac{120b^2 + 3a}{20b}$

49) $\dfrac{8 + 3vu + 18v^2}{12v^2}$

50) $\dfrac{16 - x^2}{16x}$

51) $\dfrac{9x^2 - 125}{25}$

52) $\dfrac{(r - 7)(r + 8)}{8}$

53) $\dfrac{n + 7}{n + 6}$

54) $a^2 + a + 7$

55) $-x^3 + x + 1$

56) -3

57) 30

58) 5

59) 153

60) $35°$

61) $40°$

62) $\dfrac{5\pi}{18}$

63) $\dfrac{5\pi}{4}$

64) $60°$

65) $355°$

66) 0

67) $\dfrac{\sqrt{2}}{2}$

68) $-\dfrac{1}{2}$

69) $-\dfrac{\sqrt{2}}{2}$

70) 0