

Review #2

Solve each equation.

1) $\ln(x-6) - \ln 10 = 1$

$$10e + 6$$

2) $\ln 7 + \ln 5x = \ln 45$

$$\frac{9}{7}$$

3) $\log_2(10 - 4x^2) + \log_2 5 = \log_2 5$

$$+\frac{3}{2}$$

4) $\log_7(x+7) + \log_7(x+13) = 1$

$$-6$$

5) $\log_3(x+2) - \log_3(x+1) = 1$

$$-\frac{1}{2}$$

6) $\log_5(x+2) - \log_5(x+4) = 2$

NO solution

7) $125 \cdot \left(\frac{1}{625}\right)^{3v} = 625$

$$-\frac{1}{12}$$

8) $16^{-3x} \cdot 64^{-3x-2} = 16$

$$-\frac{8}{15}$$

9) $-e^{4a} = -4$

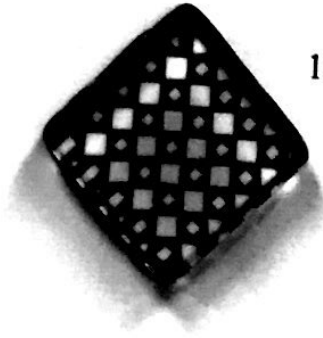
$$\frac{\ln 4}{4}$$

10) $7 \cdot 13^{n+8} = 5$

$$\log_{13} \frac{5}{7} - 8$$

$$11) -9 \cdot 13^{5n} = -35$$

$$\frac{\log_{13} \frac{35}{9}}{5}$$



$$12) 9 \cdot 10^{n-7} = 21$$

$$\log \frac{7}{3} + 7$$

$$13) 243^{x-1} = 27$$

$$\frac{8}{5}$$

$$14) \left(\frac{1}{64}\right)^{-3b+2} = \frac{1}{16}$$

$$\frac{4}{9}$$

$$15) \left(\frac{1}{2}\right)^{3m+2} = 8^{-m}$$

No solution

$$16) 2 \cdot 18^{x-6} = 44$$

$$\log_{18} 22 + 6$$

$$17) e^{k+10} - 2 = 78$$

$$\ln 80 - 10$$

$$18) 3^{4x} - 5 = -5$$

No solution

$$19) -6 \cdot 6^{6-5x} = -18$$

$$\frac{-\log_6 3 + 6}{5}$$

$$20) e^{-10a-5} + 1 = 4$$

$$\frac{-\ln 3 - 5}{10}$$

$$21) -6 \cdot 14^{3x+2} = -20$$

$$\frac{\log_{14} \frac{10}{3} - 2}{3}$$

$$22) \log_3 (3n-4) = \log_3 (2n+3)$$

$$7$$

$$23) \ln(n+10) = \ln -n$$

$$-5$$

$$24) \log_{11}(20+3v^2) = \log_{11}(4v^2 - v)$$

$$-4,5$$

$$25) -5 \ln(n+7) = -20$$

$$e^4 - 7$$

$$26) \log_3(x-7) - 10 = -11$$

$$\frac{22}{3}$$

$$27) -9 \log_{11}(n+5) = 9$$

$$\frac{-54}{11}$$

$$28) \log_8 2 + \log_8 4x^2 = 5$$

$$\pm 64$$

$$29) \ln 3x^2 - \ln 3 = 4$$

$$\pm e^2$$

$$30) \log_3 x + \log_3(x+60) = \log_3 61$$

$$1$$

Expand each logarithm.

$$31) \ln(wu^2 \cdot v^3)$$

$$\ln w + 2 \ln u + 3 \ln v$$

$$32) \log_7(c^4 \sqrt[3]{a})$$

$$4 \log_7 c + \frac{1}{3} \log_7 a$$

Condense each expression to a single logarithm.

$$33) 2 \log_7 u - \log_7 w - 2 \log_7 v$$

$$\log_7 \left(\frac{u^2}{wv^2} \right)$$

$$34) 5 \log_6 u + 5 \log_6 w - 25 \log_6 v$$

$$\log_6 \left(\frac{u^5 w^5}{v^{25}} \right)$$

Use the properties of logarithms and the values below to find the value indicated. Do not use a calculator to evaluate the logs.

35) $\log_7 10 \approx 1.2$
 $\log_7 4 \approx 0.7$
 $\log_7 6 \approx 0.9$
 Find $\log_7 160$

2.6

36) $\log_7 12 \approx 1.3$
 $\log_7 5 \approx 0.8$
 $\log_7 8 \approx 1.1$
 Find $\log_7 \frac{7}{64}$

-1.2

Use the properties of logarithms and the logarithms provided to rewrite each logarithm in terms of the variables given.

37) $\log_9 8 = U$
 $\log_9 6 = V$
 $\log_9 5 = W$
 Find $\log_9 \frac{15}{4}$

$W + V - U$


38) $\log_3 10 = P$
 $\log_3 8 = Q$
 $\log_3 11 = R$
 Find $\log_3 363$

$1 + 2R$

Determine the domain, range, asymptote equation(s), and end behavior. List transformations for

#39-40

39) $y = 4 \cdot \left(\frac{1}{2}\right)^{x-2} - 1$




$D: (-\infty, \infty)$
 $R: (-1, \infty)$
 HA: $y = -1$

$\lim_{x \rightarrow -\infty} f(x) = \infty$
 $\lim_{x \rightarrow \infty} f(x) = -1$

*v stretch by 4
right 2
down 1*

40) $y = -4 \cdot \left(\frac{2}{3}\right)^{-4x}$

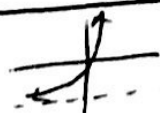


$D: (-\infty, \infty)$
 $R: (-\infty, 0)$
 HA: $y = 0$

$\lim_{x \rightarrow -\infty} f(x) = 0$
 $\lim_{x \rightarrow \infty} f(x) = -\infty$

*reflection
x-axis +
y-axis +
H. shrink
by 1/4*


41) $y = 6^{\frac{1}{2}x-4} - 5$



$D: (-\infty, \infty)$
 $R: (-5, \infty)$
 HA: $y = -5$

$\lim_{x \rightarrow -\infty} f(x) = -5$
 $\lim_{x \rightarrow \infty} f(x) = \infty$

42) $y = -3 \cdot 2^{x+2} + 1$



$D: (-\infty, \infty)$
 $R: (-\infty, 1)$
 HA: $y = 1$

$\lim_{x \rightarrow -\infty} f(x) = 1$
 $\lim_{x \rightarrow \infty} f(x) = -\infty$

43) $f(x) = -x^5 + 4x^3 - 2x + 2$

D+R: $(-\infty, \infty)$

NO asy

$\lim_{x \rightarrow -\infty} f(x) = \infty$

$\lim_{x \rightarrow \infty} f(x) = -\infty$

44) $f(x) = x^4 - 3x^2 + 1$

D: $(-\infty, \infty)$

Range \rightarrow skip

NO asy

$\lim_{x \rightarrow -\infty} f(x) = \infty$

$\lim_{x \rightarrow \infty} f(x) = \infty$

45) $y = \log_{\frac{1}{5}} \left(\frac{1}{2}(x+2) \right) - 2$

D: $(-2, \infty)$

R: $(-\infty, \infty)$

VA: $x = -2$

$\lim_{x \rightarrow -2} f(x) = \infty$

$\lim_{x \rightarrow \infty} f(x) = -\infty$

46) $y = -\log_5(x-1) + 7$

D: $(1, \infty)$

R: $(-\infty, \infty)$

VA: $x = 1$

$\lim_{x \rightarrow 1} f(x) = \infty$

$\lim_{x \rightarrow \infty} f(x) = -\infty$

47) $y = \log -2x + 7$

D: $(-\infty, 0)$

R: $(-\infty, \infty)$

VA: $x = 0$

$\lim_{x \rightarrow -\infty} f(x) = \infty$

$\lim_{x \rightarrow 0} f(x) = -\infty$

48) $y = \ln(x-1) + 4$

D: $(1, \infty)$

R: $(-\infty, \infty)$

VA: $x = 1$

$\lim_{x \rightarrow 1} f(x) = -\infty$

$\lim_{x \rightarrow \infty} f(x) = \infty$

49) $y = 2\sqrt[3]{x}$

D+R: $(-\infty, \infty)$

NO asy

$\lim_{x \rightarrow -\infty} f(x) = -\infty$

$\lim_{x \rightarrow \infty} f(x) = \infty$

50) $y = -\frac{3}{5}\sqrt{x+2} - 2$

D: $[-2, \infty)$

R: $(-\infty, -2]$

NO asy

$\lim_{x \rightarrow -2} f(x) = \text{DNE}$

$\lim_{x \rightarrow \infty} f(x) = -\infty$

51) $f(x) = \frac{2}{x+2} - 3$

D: $(-\infty, -2) \cup (-2, \infty)$

R: $(-\infty, -3) \cup (-3, \infty)$

$x = -2, y = -3$

$\lim_{x \rightarrow -2} f(x) = -3$

$\lim_{x \rightarrow \infty} f(x) = -3$

52) $f(x) = -\frac{3}{x} - 1$

D: $(-\infty, 0) \cup (0, \infty)$

R: $(-\infty, -1) \cup (-1, \infty)$

$x = 0, y = -1$

$\lim_{x \rightarrow -\infty} f(x) = -1$

$\lim_{x \rightarrow \infty} f(x) = -1$

53) $y = -3|2x| - 1$

D: $(-\infty, \infty)$

R: $(-\infty, -1]$

NO asy

$\lim_{x \rightarrow -\infty} f(x) = -\infty$

$\lim_{x \rightarrow \infty} f(x) = -\infty$

54) $y = (x-6)^3$

D+R: $(-\infty, \infty)$

NO asy

-5-

$\lim_{x \rightarrow -\infty} f(x) = -\infty$

$\lim_{x \rightarrow \infty} f(x) = \infty$

Given a standard deck of 52 cards, find the following probabilities.

55) Drawing 2 cards at random and getting an ace and a 4

$$\frac{4}{52} \cdot \frac{4}{51} = \frac{1}{663}$$

56) Drawing a red card or a 6

$$\frac{26}{52} + \frac{4}{52} - \frac{2}{52} = \frac{28}{52} = \frac{7}{13}$$

57) Picking a heart or a diamond.

$$\frac{13}{52} + \frac{13}{52} = \frac{1}{2}$$

58) Drawing a red card, replacing it, and drawing an ace.

$$\frac{26}{52} \cdot \frac{4}{52} = \frac{1}{26}$$

59) Drawing a face card or a black card

$$\frac{12}{52} + \frac{26}{52} - \frac{6}{52} = \frac{8}{13}$$

60) Drawing a card with a number less than 4 or drawing a jack.

$$\frac{8}{52} + \frac{4}{52} = \frac{3}{13}$$

61) Drawing a 3, not replacing it, then drawing the Queen of Hearts.

$$\frac{4}{52} \cdot \frac{1}{51} = \frac{1}{663}$$

62) In how many ways can 5 people stand in line?

$$5! = 120$$

63) In how many ways can the word "TALLAHASSEE" be arranged?

$$\frac{11!}{(3!2!2!2!)} = 831,600$$

64) A restaurant offers four sizes of pizza, two types of crust, and eight toppings. How many possible pizza options are there?

$$64$$

65) How many even 2 digit numbers less than 80 are there?

$$\frac{7}{1,2,3,4,5,6,7} \cdot \frac{5}{0,2,4,6,8} = 35$$

66) In how many ways could you choose the first and second place winners at a cat show with 50 cats in the show?

$$50P_2 = 2450$$