

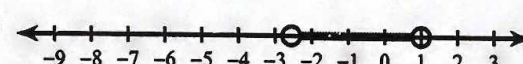
Answers to Quarter 1 TEST Review

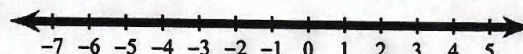
1) No solution.

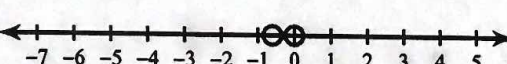
2) $\{-4, 4\}$

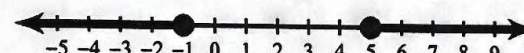
3) $\{4, -6\}$

4) $\left\{0, -\frac{2}{5}\right\}$

5) $-\frac{23}{9} < b < 1$: 

6) { All real numbers. } : 

7) $-\frac{3}{5} < n < 0$: 

8) $p \geq 5$ or $p \leq -1$: 

9) $\{4\}$

10) $\{-3\}$

11) $\{3\}$

12) $\{-10\}$

13) $\{6\}$

14) $\{3\}$

15) $\{1\}$

16) $\{180\}$

17) $-7 - 12x - 3x^2$

18) $\frac{1}{64}n^3 - \frac{5}{16}n^2 - \frac{1}{4}n$

19) $t^2 - 7t + 10$

20) $54n^3 - 27n^2$

21) Yes

22) No

23)

twice as tall
even; y-axis is
line of symmetry

24)

reflects over x-axis
 $\frac{1}{3}$ as tall
right 3
down 4
Neither

25)

twice as tall
down 4
Neither

26)

twice as tall
right 2
UP 2
Neither

27)

reflects over x-axis
up 3
even; y-axis is line
of symmetry

28)

left 4
down 4
Neither

29) $\left\{\frac{3}{5}\right\}$

30) $\left\{\frac{4}{9}\right\}$

31) $\left\{-\frac{5}{12}\right\}$

32) $\left\{\frac{5}{4}\right\}$

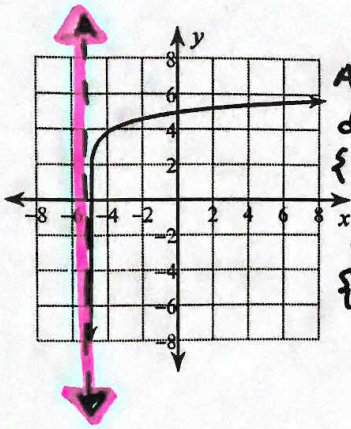
33) 1.15

34) -0.41

35) 0.63

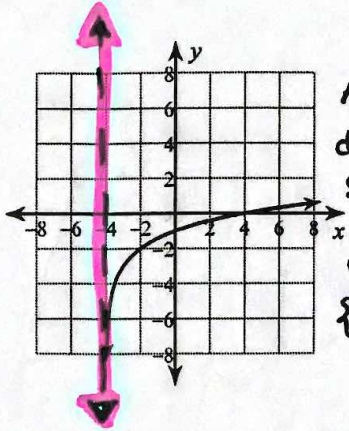
36) 1.94

37)



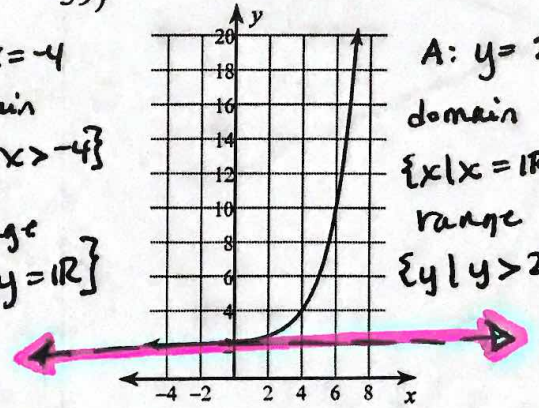
A: $x = -5$
 domain
 $\{x | x > -5\}$
 range
 $\{y | y \in \mathbb{R}\}$

38)



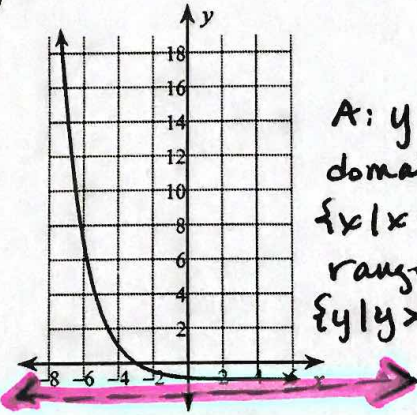
A: $x = -4$
 domain
 $\{x | x > -4\}$
 range
 $\{y | y \in \mathbb{R}\}$

39)



A: $y = 2$
 domain
 $\{x | x \in \mathbb{R}\}$
 range
 $\{y | y > 2\}$

40)



A: $y = -1$
 domain
 $\{x | x \in \mathbb{R}\}$
 range
 $\{y | y > -1\}$

41) $m^2 + 9m - 6 - \frac{9}{m-5}$

42) $7v^2 - \frac{4}{v+7}$

43) $7n^3 + 1 + \frac{8}{5n+4}$

44) $6n^4 + 3n + 1 - \frac{8}{n-2}$

45) Yes

46) Yes

47) $f(x) = x^3 - 3x^2 - 10x$

48) $f(x) = x^3 + x - 10$

49) $1 + 2i$

50) $-3 - i, -3i$

51) $f(x) \rightarrow +\infty$ as $x \rightarrow -\infty$
 $f(x) \rightarrow -\infty$ as $x \rightarrow +\infty$

52) $f(x) \rightarrow +\infty$ as $x \rightarrow -\infty$
 $f(x) \rightarrow +\infty$ as $x \rightarrow +\infty$

53) $\left\{0, 1, \frac{1}{5}, -\frac{1}{2}\right\}$

54) $\left\{-\frac{1}{2} \text{ mult. } 2, -1, \frac{1}{5}\right\}$

55) $\left\{0, 1, -\frac{1}{2}, -4 + 3i, -4 - 3i\right\}$

56) $\left\{0, 4, \frac{2\sqrt{3}}{3}, -\frac{2\sqrt{3}}{3}\right\}$

57) $\left\{0, 4, \frac{i}{2}, -\frac{i}{2}\right\}$

58) $\left\{3, \frac{1}{2}, 4i, -4i\right\}$

59) $\{-2, 2 + \sqrt{5}, 2 - \sqrt{5}\}$

60) Possible rational zeros: $\pm 1, \pm \frac{1}{3}$

Zeros: $\left\{\frac{1}{3}, 1 \text{ mult. } 2\right\}$

Evaluate each of the following functions at $x = -2$.

61. $f(x) = 3x + 1$ -5

62. $g(x) = 3x^2$ 12

63. $s(x) = x - |x|$ -4

64. $r(x) = \frac{x-5}{x^2}$ $-\frac{7}{4}$

65. $y(y(x))$, where $y(x) = x^2 - 1$ 8

66. $t(x) = 3x^2 + 5x + 3$ 5

Give the domain of each function.

67. $a(x) = 5x - 1$ $\{x | x \in \mathbb{R}\}$

68. $k(x) = |x|$ $\{x | x \in \mathbb{R}\}$

69. $c(x) = \frac{5}{x-3}$ $\{x | x \neq 3\}$

70. $m(x) = \sqrt{3x}$ $\{x | x \geq 0\}$

71. $e(x) = \frac{3x}{(x-1)(x-2)}$ $\{x | x \neq 1, 2\}$

72. $b(x) = \sqrt{2x+6}$ $\{x | x \geq -3\}$

• For 73-75. Solve each system.

73. $3x + 4y = 2$
 $2x - 5y = 9$

$(2, -1)$

74. $6x + 3y = 9$
 $4x + 2y = 7$

no solution

75. $\frac{5}{x} + \frac{2}{y} = 4$

$\frac{3}{x} - \frac{4}{y} = 5$

$(1, -2)$

• For 76+77. A collection of coins containing dimes and quarters is worth \$3.45. There are four more quarters than dimes. Let d be the number of dimes and q be the number of quarters.

76. Write a system of two linear equations in two variables for the given data.

$10d + 25q = 345$
 $q = d + 4$

77. Solve the system to find the number of each coin. $d = 7, q = 11$

• For 78 + 79 It takes a plane 3 h to fly 480 km with the wind and 4 h on the return trip against the wind. Let x be the speed of the plane in still air and y be the speed of the wind.

78. Write a system of two linear equations in two variables for the given data.

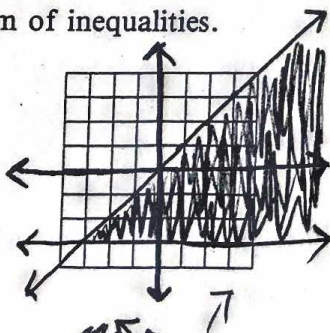
$3(x+y) = 480$
 $4(x-y) = 480$

79. Solve the system to find the speed of the plane in still air and the speed of the wind.

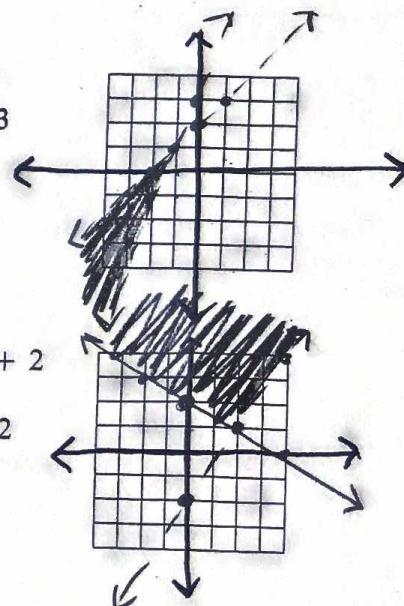
$x = 140 \text{ km/hr}$ $y = 20 \text{ km/hr}$

Graph each system of inequalities.

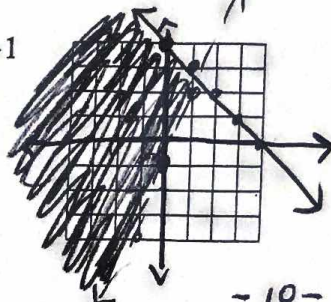
80. $y \geq -3$
 $y \leq x$



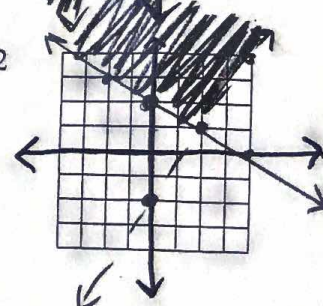
81. $y < x + 2$
 $y > 2x + 3$



82. $y - 3x > -1$
 $y + x \leq 4$
 $y > 3x - 1$
 $y \leq -x + 4$



83. $y \geq -\frac{1}{2}x + 2$
 $y > \frac{3}{2}x - 2$



Simplify each logarithm.

84. $\log_6 36 = \underline{2}$

86. $\log_3 \frac{1}{9} = \underline{-2}$

88. $\log_{\frac{1}{2}} 4 = \underline{-2}$

90. $\log_{10} 0.001 = \underline{-3}$

85. $\log_2 128 = \underline{7}$

87. $\log_5 1 = \underline{0}$

89. $\log_8 4 = \underline{\frac{2}{3}}$

91. $\log_{\sqrt{3}} \frac{1}{27} = \underline{-6}$

Solve.

92. $\log_3 x = 3 \quad \underline{x = \frac{27}{1}}$

94. $\log_{\sqrt{3}} 9 = x \quad \underline{x = 4}$

96. $\log_x \frac{1}{16} = -8 \quad \underline{x = \sqrt{2}}$

93. $\log_x \frac{1}{64} = -3 \quad \underline{x = 4}$

95. $\log_{\frac{1}{8}} x = -\frac{4}{3} \quad \underline{x = 16}$

97. $\log_{\frac{1}{10}} 10,000 = x \quad \underline{x = -4}$

Express as a single logarithm.

98. $\log_3 d - \log_3 i + \log_3 k - \log_3 n \quad \underline{\log_3 \frac{dk}{in}}$

99. $3 - \log_3 r \quad \underline{\log_3 \frac{27}{r}}$

100. $2 \log_2 m + \frac{1}{2} \log_2 n \quad \underline{\log_2 m^2 n^{\frac{1}{2}}}$

101. $\log \frac{a}{b} - 2 \log \frac{a}{b} \quad \underline{\log \frac{b}{a}}$

Solve for x.

102. $\log_7 x = \log_7 4 + \log_7 3 - \log_7 2 \quad \underline{x = 6}$

103. $\log_3 x = 4 \log_3 2 + \log_3 5 - \log_3 4 \quad \underline{x = 20}$

104. $\log_5 x = \frac{1}{2} \log_5 9 + \log_5(x-1) \quad \underline{x = \frac{3}{2}}$

106. $\log_6(x-4) - \log_6 3 = \log_6 2 \quad \underline{x = 10}$

105. $\log_7 3x^2 = 2 \log_7 24 - \log_7 3 \quad \underline{x = \pm 8}$

107. $2 \log_m(x+1) - \log_m 4 = 0 \quad \underline{x = 1}$

108. The half-life of the Sulfur-35 isotope is 87.1 days. How much of a 2 g sample will remain after 100 days?

0.902 g

109. Population studies of fiddler crabs on a tropical island reported 1.1×10^4 in 1980 and 1.5×10^4 in 1982. Predict the time that the maximum population, 2.0×10^4 , that can be supported by the island's resources will be reached.

omit

110. If Heather invests \$2000 in a fund that earns 10%, compounded every 6 months, how much will she have after 20 years?

\$ 14,000

Simplify.

111. $\ln e^5 = \underline{5}$

112. $\ln e^{\frac{1}{2}} = \underline{\frac{1}{2}}$

113. $e^{\ln 3} = \underline{3}$

Write as a single logarithm.

114. $\ln 4 + \ln 3 - 6 = \underline{\ln \left(\frac{12}{e^6} \right)}$

115. $\frac{1}{4} \ln 2 + \ln 4 = \underline{\ln 2^{\frac{3}{4}}}$