

MATH 1113 Reading Day Worksheet

Identify the domain, range, extrema, intervals on increase and decrease, and end behavior of each. Then sketch the graph.

1. $y = -|x+1|$
2. $y = (x-1)^3 + 2$
3. $y = 2x^2$
4. $y = \sqrt{2x} - 1$
5. $y = \frac{x}{3} - 4$

Graph

6. $y = \begin{cases} 2x - 4, & x \leq 2 \\ (x - 2)^2, & x > 2 \end{cases}$
7. $y = \begin{cases} 2|x|, & x < 0 \\ \sqrt{3x}, & x > 0 \end{cases}$

Determine if the equation defines y as a function of x . Is it one-to-one?

8. $y = x^2$
9. $y^2 = x$
10. $y = x^3$

Given $f(x) = x^2 - 2x + 1$ and $g(x) = \sqrt{x}$, find

11. $f(x) - g(x)$
12. $f(g(x))$
13. $g(f(x))$
14. $\frac{g(x)}{f(x)}$

Find the inverse of each function. Graph the function and its inverse

15. $y = x^2 + 1$
16. $y = \sqrt{x - 1}$
17. $y = 4x - 2$
18. $y = 2|x - 1|$
19. $y^2 = x - 1$

Find the distance and midpoint between the two points

20. $(-1, 2)$ and $(4, -2)$
21. $(2, 1)$ and $(3, 9)$
22. $(-2, 4)$ and $(-1, 3)$

Find the center and radius of the given circle

23. $x^2 + y^2 = 1$
24. $(x-1)^2 + (y+2)^2 = 9$

25. $x^2+2x+y^2-6y-6=0$

Find the equation for a circle that has a diameter with endpoints...

26. (-2, -2) and (4, 6)

27. (1, 3) and (7, -5)

Find the equation of a line that goes through...

28. (1, 3) and (4, -2)

29. (2, 6) and (17, -4)

30. (1, 2) and (3, 4)

31. (1, 7) and (9, 7)

Determine degree, symmetry, end behavior, possible # of turns, x, intercepts, and the multiplicity of each x-intercept

32. $y=-x^2+7x-12$

33. $y= x^2+2x+1$

34. $y= x^3-x$

35. $y= x^4-x^2-2$

36. $y=(x-1)^2(x+1)^3(x-2)^5$

37. $y=x^3-3x^2-2x+6$

Use x-intercepts, multiplicities, and end behavior to sketch

38. $y=-(x-1)^2(x)(x+1)$

39. $y=(x+1)^5(x-3)^2(x)^3$

Give the vertex, axis of symmetry, x and y intercepts, and end behavior

40. $y=-x^2+6x-9$

41. Give the equation of a parabola with a vertex at (-1, 2) which goes through the point (1, -6)

Factor and solve

42. $x^2-2x+1=0$

43. $x^4-6x^2+8=0$

Factor by grouping

44. $x^3-2x^2+6x-12=0$

45. $2x^5-4x^3+6x^2-12=0$

List all possible rational zeroes. Then find the real zeroes and their multiplicities.

46. x^3-3x+2

47. $2x^3-6x^2+8$

Use long division

$$48. x^3+3x^2+3x+1 \div x^2+2x+1$$

Use synthetic division

$$49. x^3+3x^2+3x+1 \div x+1$$

$$50. x^3-3x^2+3x-1 \div x-1$$

Give any vertical, horizontal, or slant (oblique) asymptotes, x and y intercepts, and removable discontinuities (if any). Then sketch

$$51. y = \frac{1}{x+1}$$

$$52. y = \frac{x^2+2x+1}{x+2}$$

$$53. y = \frac{x^3+3x-4}{x^2+6x+8}$$

$$54. y = \frac{x}{x^2}$$

$$55. y = \frac{6x^2-24}{2x^2+4x+2}$$

List any asymptotes, x and y intercepts, and graph.

$$56. y=2^{x+3}-1$$

$$57. y=e^x$$

Evaluate

$$58. \log_2 8$$

$$59. \log_3 \frac{1}{9}$$

$$60. \ln(e^3)$$

61. Logs and exponentials are _____ operations/functions. (fill in the blank)

Condense

$$62. 2\log(x)+3\log(y)-\log(z)$$

$$63. \log(x^2)-6\log(z)$$

Expand

$$64. \ln \frac{x^2y}{z^3}$$

If $\ln(a)=3$, and $\ln(b^2)=8$, evaluate

$$65. \ln \frac{a^2}{b}$$

$$66. \ln(ab)$$

Solve for x

$$67. x=\ln\sqrt{e}$$

68. $2^{x-2}=16$

69. $2^{x+1}=8^{x-1}$

70. $\log_2(x)+\log_2(x+2)=3$

71. $x=\log_3(27)$

Fill in the table

72.

Degrees	Radians	Complementary Angle	Supplementary Angle	Coterminal Angle	Reference Angle
45					
30					
	$\frac{7\pi}{6}$				
	$\frac{2\pi}{3}$				
270					
	2π				

Evaluate

73. $\sec(\pi)$

74. $\cos(135^\circ)$

75. $\sin(\frac{4\pi}{3})$

76. $\cot(\frac{9\pi}{3})$

77. $\tan(415^\circ)$

78. $\csc(30^\circ)$

79. $\cot(\frac{7\pi}{4})$

80. $\csc(\frac{7\pi}{6})$

The point (6, -8) is the endpoint of a radius of a circle in standard position.

81. Evaluate the 6 basic trig functions for the angle this radius makes with the positive x-axis.

Given $\cot(\theta)=-\frac{1}{3}$ and θ is in quadrant II,

82. Find $\sin(\theta)$ and $\sec(\theta)$

Given $\sin(\phi)=\frac{-3}{\sqrt{34}}$ and $\sec(\phi)=\frac{\sqrt{34}}{5}$

83. Find $\tan(\phi)$ and $\cot(\phi)$

Give amplitude (or vertical stretch factor), period, phase shift, and vertical shift (or axis of oscillation) for each, then sketch the graph for at least one full period.

84. $y=\sin(2x)-1$

85. $y=\csc(2x)-1$

86. $y=2\cos(x+\pi)$

87. $y=2\sec(x+\pi)$

88. $\tan(\pi x)$

89. $2\cot(2x-\pi)$

Using $S=r\theta$,90. Find the length of an arc with a radius of 2 inches intercepted by an angle of 210°

Evaluate

91. $\sin^{-1}\left(\frac{-1}{2}\right)$

92. $\sec^{-1}(-2)$

93. $\csc^{-1}(\sqrt{2})$

94. $\cos^{-1}(-1)$

95. $\tan^{-1}(1)$

96. $\cot^{-1}(-\sqrt{3})$

Evaluate using a sketch (SOHCAHTOA)

97. $\cot(\csc^{-1}(-2))$

98. $\cos(\sin^{-1}\left(\frac{\sqrt{2}}{2}\right))$

99. $\sec(\tan^{-1}(1))$

100. $\sin(\sin^{-1}\left(\frac{1}{2}\right))$

Simplify using product-to-sum formulas

101. $\cos(64^\circ)\cos(4^\circ)$

102. $\sin\left(\frac{-7\pi}{6}\right)\sin\left(\frac{-5\pi}{6}\right)$

Evaluate

103. $\sin\left(\frac{7\pi}{12}\right)\cos\left(\frac{5\pi}{12}\right)$

104. $2\sin(75^\circ)\cos(75^\circ)$

105. $\frac{2\tan(15^\circ)}{1-\tan^2(15^\circ)}$

106. $\tan\left(\frac{\pi}{8}\right)$

Given $\sin(\theta)=\frac{-4}{5}$ and θ is in quadrant III, find

107. $\tan\left(\frac{\theta}{2}\right)$

108. $\cos\left(\frac{\theta}{2}\right)$

109. $\cos(2\theta)$

110. $\cot(2\theta)$

Verify

111. $(\cos(x)+1)(\cos(x)-1)=\frac{1}{\csc^2 x}$

$$112. \sin^2 x + (\cot^2 x)(\sin^2 x) = \sec^2 x - \tan^2 x$$

$$113. \sin(x)\tan(x) + \cos(x) = \tan(x)\csc(x)$$

$$114. \cos(x)\tan(x) = \frac{1}{\csc(x)}$$

$$115. \cos\left(\frac{\pi}{2} - x\right) = \sin(x)$$

$$116. \frac{\cot(x) - \tan(x)}{\sin(x)\cos(x)} = \cos^2 x - \sec^2 x$$

$$117. \frac{\sec^2 x}{\sec^2 x - 1} = \csc^2 x$$

$$118. (\tan^2 x)(\sin^2 x) = \tan^2 x - \sin^2 x$$

$$119. (\csc^2 x)(\tan^2 x) - 1 = \tan^2 x$$

$$120. \tan(x)\cot(x) - \sin^2 x = \frac{\cos(x)}{\sec(x)}$$

Give the general solution, and all solutions on the interval $[0, 2\pi)$

$$121. \cos(x) = \frac{\sqrt{2}}{2}$$

$$122. 4\sin^2 x = 3$$

$$123. 3\sec(x) = -6$$

$$124. \sin^2 x + \cos(2x) - \cos^2 x = 0$$

$$125. \frac{\sin(x)}{1 + \cos(x)} = -1$$

$$126. \cot^2 x = 1$$

Solve using substitution

$$127. 3x - y = -5$$

$$2x + y = 0$$

$$128. x - y = 7$$

$$2x - 2y = 14$$

Solve using elimination

$$129. x - y = 3$$

$$2x - y = 7$$

$$130. x + 2y = 6$$

$$3x + 6y = -12$$

Solve using any method

$$131. 2x - y + z = -3$$

$$x + y - z = 6$$

$$x - y + 2z = -7$$

Graph the solution

$$132. x > 2$$

$$y \leq 3x - 4$$

$$133. y > x + 1$$

$$y < x + 4$$

$$134. x \geq 3$$

$$y \leq 6$$

$$135. x > 3$$

$$y > 6$$

$$y < 2x + 1$$

$$136. y < x + 2$$

$$y < -x + 2$$

$$y \geq 0$$

$$137. x < 6$$

$$y > 2x - 1$$

$$y < 8$$

Find the focus, directrix, and value of p , then graph

$$138. y - 1 = \frac{1}{4}(x - 1)^2$$

$$139. 12x = (y + 1)^2$$

$$140. y = 2x^2 + 4x - 1$$

$$141. y = x^2 + 6x + 5$$

Find the vertices and foci, and values for a , b , and c . Graph and label major axis, minor axis, vertices, and foci.

$$142. \frac{x^2}{4} + \frac{y^2}{9} = 1$$

$$143. 4(x - 1)^2 + 9(y - 2)^2 = 36$$

$$144. \frac{(x - 1)^2}{9} + \frac{(y + 1)^2}{9} = 1$$