Name _____ Honors Calculus I
Review Packet 2010-2011

Answer all questions in this packet. You must show all work.

Solve each of the following inequalities. State the solution in interval notation and graph the solution on the number line.

1. $x^2 - 7x + 12 \leq 0$

2. $|2x - 3| \geq 1$

Find the equation of the line given the following information.

3. Containing the points (2, 1) and (0, -3)

4. Containing the points (5, 1) and (5, 8)

5. Containing the points (1. -2) and (3, -2)

6. x-intercept: (2,0); y-intercept (0, 3)

Write an equation of a line through the point P (a) parallel to the given line L and (b) perpendicular to the given line L.

7, P = (2, 1) L; 4x – 2y = 3

8. P = (2, 5) L: x = 4

9. P = (-1, 0) L: y = -3

10. P = (-6, 4) L: 3x + 4y = 7

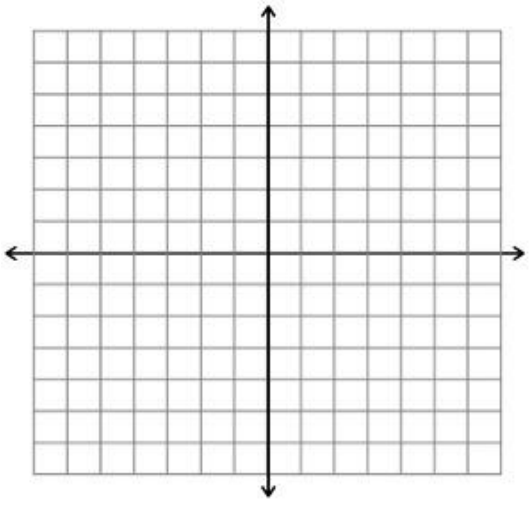
11. Evaluate the function as indicated. Determine its domain and range.

$$f(x)=\begin{cases} x^2+2, x\le 1 \\ 2x^2+2, x>1 \end{cases}$$

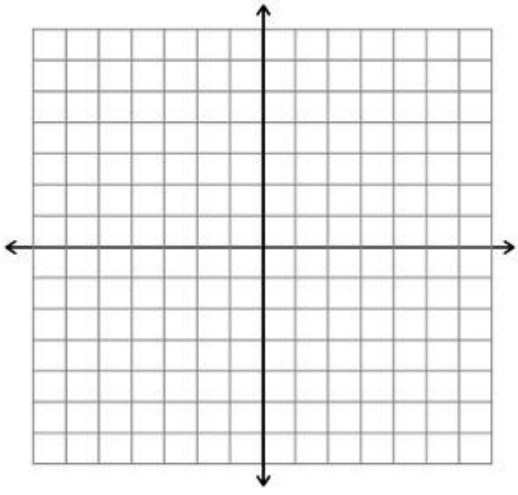
a) f(-2) b) f(0) c) f(1) d) $f(x^2+2)$

Sketch the graph of the function (by hand) and find the domain and range. Use a graphing utility to verify your graph.

12. $h(x)=\sqrt{x-1}$

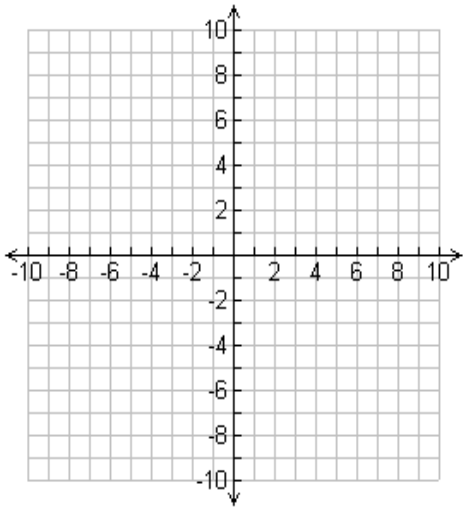


13. $g(x)=\dfrac{4}{x+1}$

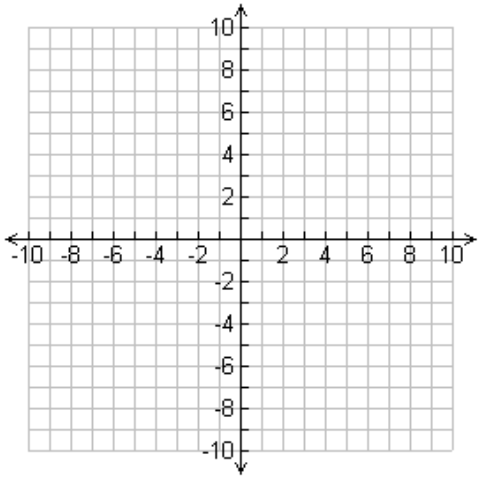


Find the inverse of the function *f*, Graph (by hand) *f* and f^{-1}. Determine the relationship between the graphs.

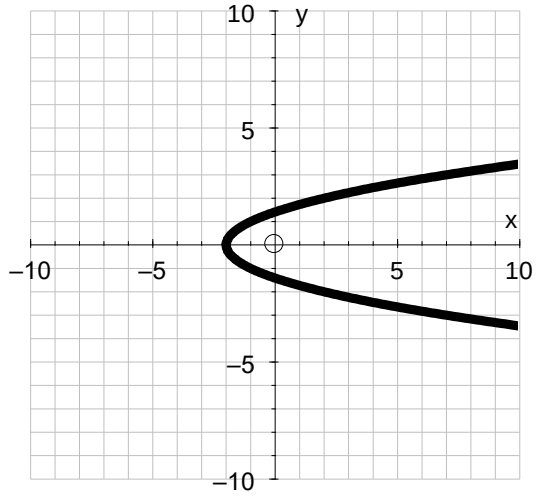
14. $f(x) = x^3 - 1$



15. $f(x) = x^2 + 2, x \geq 0$



16. The graph of the function y = *f*(x) is shown below. On the same coordinate axes graph $y = f^{-1}(x)$



17. Determine the values of y whose distance from $(-6, 2)$ to (2, y) is 10 units.

18. Find the standard form of the equation of a circle whose ends of a diameter are $(-3,-4)$ and $(6,8)$.

19. Find the coordinates of the center and the length of the radius of the circle whose general form is $x^2 + y^2 - 4x + 6y - 12 = 0$

Solve each of the following equations for x.

20. $3^x = 9^2$

21. $e^{\ln x} = 4$

22, $\ln x = 2$

23. $\ln(x^2 - 9) - \ln(x + 3) = 0$

24. $e^{\ln(x^2-9)} = 7$

25. $\log(x - 3) + \log(x - 2) = 1$

Write the expression as a logarithm of a single expression.

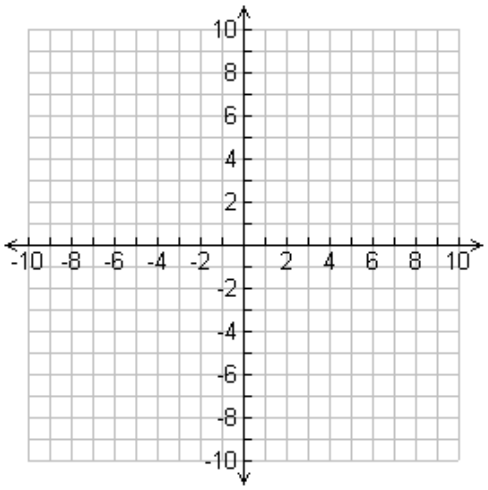
26. $3\ln x + 2\ln y - 4\ln z$

27. $\log_3 \sqrt{x} - \log_3 x^3$

Sketch the grapj of each function. State the domain and range.

28. $y = e^x - 2$

29. $y = \ln(x+1)$



Domain _____

Range _____

Domain _____

Range _____

Determine the reference angle for each of the following angles.

30. $\frac{3\pi}{4}$

31. -240^o

32. 5.98^r

33. $\frac{13\pi}{8}$

s denotes the length of arc of a circle of radius r subtended by the central angle θ. Find the missing quantity. Round answers to 3 decimal places.

34. $\theta = \frac{1}{4}$ radian, $s = 6$ cm., $r = ?$

35. $r = 3$ meters, $\theta = 120^o$, $s = ?$

36. Find values of the 6 trigonometric functions of θ, if the point P $(-5,12)$ is on the terminal side of the angle θ in standard position.

37, Find the value of $\tan\theta$ if $\sin\theta = \frac{\sqrt{2}}{2}$ and θ is in Quadrant II.

Evaluate each of the following expressions.

38. $\theta = \sin^{-1}\left(-\frac{\sqrt{3}}{2}\right), \pi < \theta < 2\pi$

39. $\theta = \sec^{-1}(2), 0 < \theta < 2\pi$

40. $\theta = \tan^{-1}(-1), -\frac{\pi}{2} < \theta < 0$

41. $\theta = \cos^{-1}(-1), \frac{\pi}{2} < \theta < \frac{3\pi}{2}.$

Solve each of the following equation where $0 \le x < 2\pi$ **.**

42. $2\sin x = 1$

43. $4\cos^2 x = 3$

44. $\sin 2x = \cos x$

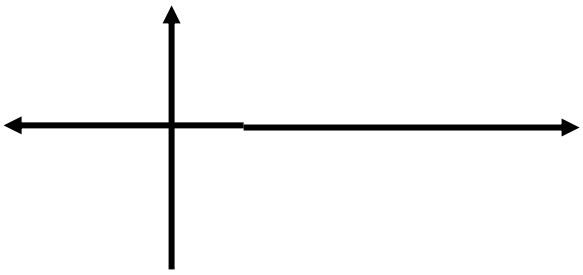
45. $\sin^2 x = 6(\cos x + 1)$

46. $\cos\cos 2x + 5\cos x + 3 = 0$

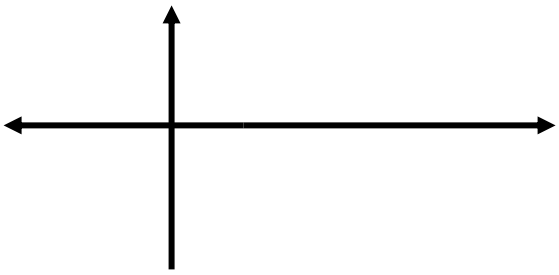
47. $\sec^2 x - 1 = \tan x + 6$

Sketch the graph of each trigonometric function over one period. Label the axes

48. $y = \frac{3}{2}\tan\left(\frac{1}{2}\theta\right)$



49. $y = -2\sin(2x - \pi) + 1$



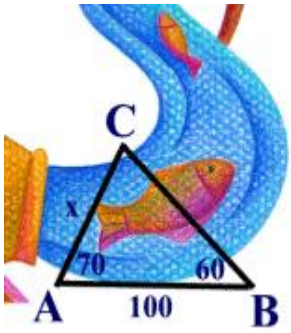
Write the equation of a sine function with the given characteristics.

50. Amplitude: 2
    Period: π
    Phase Shift: $\frac{1}{2}$

y = _____

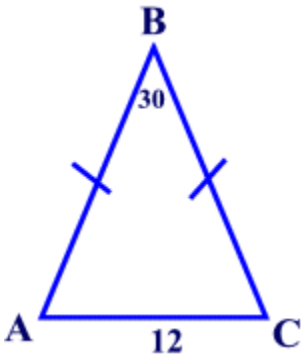
51. Amplitude: 3
    Period: 3π
    Phase Shift: $\frac{\pi}{2}$
    Vertical Shift: -2

y = _____



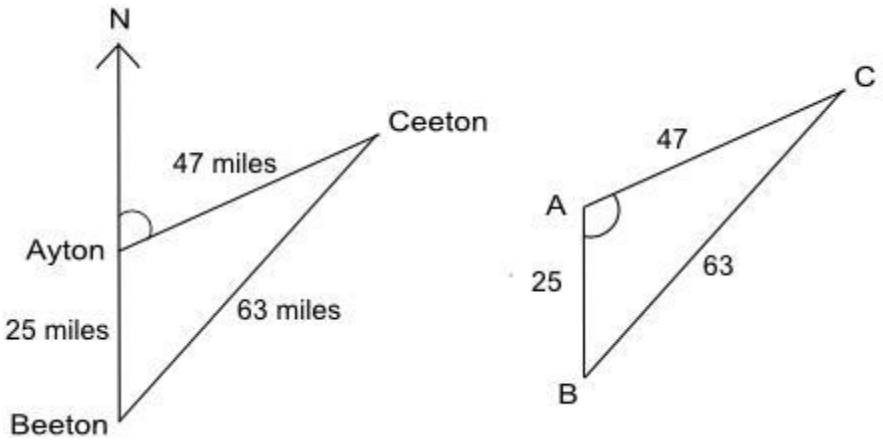
52. Points *A & B* are on one side of a river, 100' apart, with *C* on the opposite side. The angles *A* and *B* measure 70º and 60º respectively. What is the distance from point *A* to point *C*, *to nearest foot.*

53. In an isosceles triangle, the vertex angle is 30º and the base measures 12 cm. Find the perimeter of the triangle to the *nearest integer.*



54. A triangular walking course has 2 sides of 230 feet and 360 feet, and the angle between these sides measures 38º. Find the length of the third side of the course, to the *nearest foot.*

55. Ayton is 25 miles due north of Beeton. Ceeton lies to the east side the road joining Ayton to Beeton, and is 47 miles from Ayton and 63 miles from Beeton. (All roads are straight.)



Calculate the three-figure bearing of Ceeton from Ayton.

Note A three-figure bearing is always measured in a clockwise sense from the direction North.

56. Use synthetic division to deter the quotient and remainder when

$2x^3 - 3x^2 + 4x + 5$ is divided by $x - 2$.

Quotient: _____ Remainder: _____

57. Is x + 4 a factor of $x^4 + 6x^3 + 3x^2 - 8x + 48$? Justify your answer.