AP Calculus *name*_____*p*____
"Getting Warmed Up"
Calculators <u>are not</u> allowed for these problems.

Find the equation of the line passing through the following points.

1. (1, 2) and (3, 3)
2. (1, -2) and (3, -2)
3. (-3, 5) and (-3, -7)

Solve.

4. $x^2 + x - 12 = 0$
5. $x^2 - 4x + 2 = 0$
6. $2x^2 + 4x = 1$

Find the domain and range of each function.

7. $f(x) = -6x + 2$
8. $g(x) = -3x^2 + 4x - 1$
9. $h(x) = \sqrt{x+2}$

10. $g(x) = \sqrt{x^2 - 4}$
11. $f(x) = \dfrac{4}{x^2 - 1}$

Evaluate.

12. $9^{1/2}$
13. $16^{3/2}$
14. $(-125)^{2/3}$

Factor.

15. $x^2 + 4x - 32$
16. $x^2 - 10x + 24$
17. $3x^3 - 6x^2 + 4x - 8$

18. $-4(x-1)^2 + 2(x-1)$
19. $2(x+2)^2 + 3(x+2)^3$

Simplify the following.

20. $\dfrac{\dfrac{1}{x+1}-1}{x}$

21. $\dfrac{\dfrac{1}{x+3}-\dfrac{1}{3}}{x}$

22. $\dfrac{\dfrac{1}{x+8}-\dfrac{1}{8}}{x}$

Simplify by multiplying by the conjugate.

23. $\dfrac{1}{\sqrt{x+3}+\sqrt{x}}$

24. $\dfrac{10}{\sqrt{x-5}-\sqrt{x}}$

25. $\dfrac{1}{\sqrt{x-2}+\sqrt{x}}$

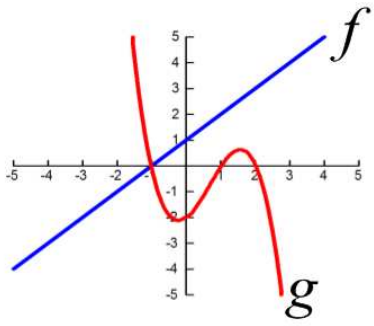
Solve for x on $0 \le x < 2\pi$**.**

26. $2\cos x - 1 = 0$

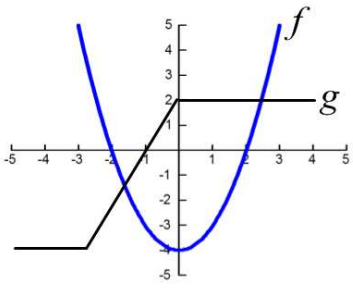
27. $2\sin x + \sqrt{3} = 0$

28. $\cos(2x) = \dfrac{\sqrt{2}}{2}$

Use the graph to the right to answer the following.



29. a) Identify the domains and ranges of *f* and *g*.
    b) Identify $f(-2)$ and $g(3)$.
    c) For what value(s) of *x* is $f(x) = g(x)$?
    d) Estimate the solution(s) of $f(x) = 2$.
    e) Estimate the solution(s) of $g(x) = 0$.



30. a) Identify the domains and ranges of *f* and *g*.
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Evaluate the function at each given input value.

31. $f(x)=2x-3$
   a) $f(0)$
   b) $f(-3)$
   c) $f(b)$
   d) $f(x-1)$

32. $f(x)=\sqrt{x+3}$
   a) $f(-2)$
   b) $f(6)$
   c) $f(-5)$
   d) $f(x^2+1)$

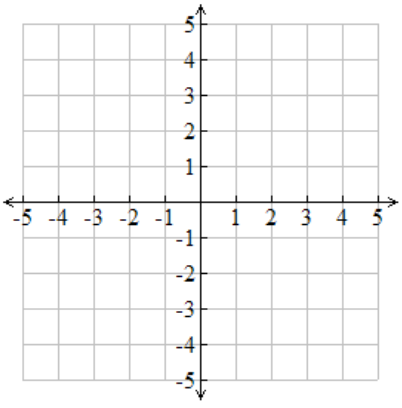
33. $f(x)=3-x^2$
   a) $f(0)$
   b) $f(\sqrt{3})$
   c) $f(-2)$
   d) $f(t-1)$

34. $f(x)=\cos 2x$
   a) $f(0)$
   b) $f\left(-\frac{\pi}{4}\right)$
   c) $f\left(\frac{\pi}{3}\right)$

35. $f(x)=\sin x$
   a) $f(\pi)$
   b) $f\left(\frac{5\pi}{4}\right)$
   c) $f\left(\frac{2\pi}{3}\right)$

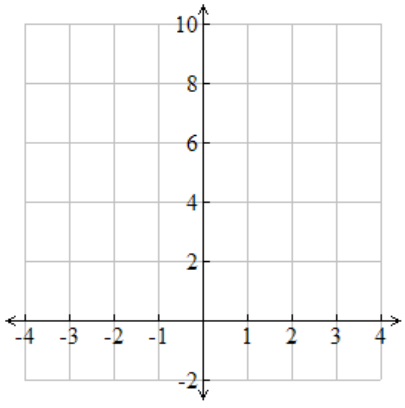
Graph the following piecewise functions. Then find each value.

36. $f(x)=\begin{cases}2x+1, & x<0\\ 2x+2, & x\geq 0\end{cases}$



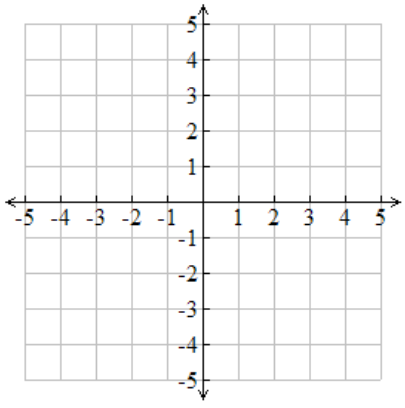
   a) $f(-1)$
   b) $f(0)$
   c) $f(2)$

37. $f(x)=\begin{cases}x^2+2, & x\leq 1\\ 2x^2+2, & x>1\end{cases}$



   a) $f(-2)$
   b) $f(0)$
   c) $f(1)$

38. $f(x)=\begin{cases}|x|+1, & x<1\\ -x+1, & x\geq 1\end{cases}$



   a) $f(-3)$
   b) $f(1)$
   c) $f(3)$

Calculators <u>are</u> allowed for these problems.

Find all real zeros. Round all answers to 3 decimal places.

39. $0 = x^3 - 3x + 1$

40. $x^4 - 3x^3 - x = -1$

41. $0 = 2x^2 + 3x + 4$

Determine whether each function is even, odd, or neither.

42. $y = x^2 - 2$

43. $y = x^3 + 2$

44. $y = \sin x$

45. $y = \cos x$

46. $y = x \cos x$

47. $y = |6 - x|$

Solve.

48. $2\cos x = 2 - x$

49. $\sin x = x^2$

Use the rules of transformations to match each function with its graph.

50. $y = f(x+5)$

51. $y = f(x) - 5$

52. $y = -f(x-4)$

53. $y = f(x+6) + 2$

54. $y = -f(-x) - 2$