

(e)  $y = -\frac{1}{9}(x+2)^2 + 5$

23. Find the quotient and the remainder of  $\frac{2x^4 - 9x^2 - 5x + 3}{x+1}$

- (a) Quotient:  $2x^2 - 11x + 6$                       Remainder: -3  
(b) Quotient:  $2x^2 - 7x - 12$                       Remainder: -9  
(c) Quotient:  $2x^3 - 11x^2 + 6x - 3$                       Remainder: 0  
(d) Quotient:  $2x^3 - 2x^2 - 7x + 2$                       Remainder: 1  
(e) Quotient:  $2x^3 + 2x^2 - 7x - 12$                       Remainder: -9

24. Solve the inequality  $\frac{x+2}{x-3} \geq 0$

- (a)  $[-2, 3)$   
(b)  $(-3, 2)$   
(c)  $(-2, 3]$   
(d)  $(-\infty, -2] \cup (3, \infty)$   
(e)  $(-\infty, -2) \cup [3, \infty)$

25. Which of following best describes the solutions of the equation  $\sqrt{x+5} = x-1$

- (a) There are two solutions: one is positive and the other is negative  
(b) There is two positive solutions  
(c) There is only one solution and it is positive  
(d) There is only one solution and it is negative  
(e) There is no real solution

26. Solve the inequality  $|3x-6|-2 \leq 10$

- (a)  $[-2, 6]$   
(b)  $(-2, 6)$   
(c)  $(-\infty, -2]$   
(d)  $[6, \infty)$   
(e)  $(-\infty, -2] \cup [6, \infty)$

27. Which of following is a factor of the polynomial  $x^3 + x^2 - 17x + 15$ ?

- (a)  $x-5$   
(b)  $x-3$   
(c)  $x+1$   
(d)  $x+2$   
(e)  $x+3$

28. Find the range of the function  $f(x) = -3e^{x+1} + 2$

- (a)  $(-\infty, 2]$   
(b)  $[2, \infty)$

- (c)  $(-\infty, 2)$
- (d)  $(-3, 2)$
- (e)  $(-\infty, \infty)$

29. Combine  $2\ln x - 3\ln y + \ln z$  into a single logarithm

- (a)  $\ln\left(\frac{x^2z}{y^3}\right)$
- (b)  $\ln\left(\frac{x^2}{y^3z}\right)$
- (c)  $\ln\left(\frac{2xz}{3y}\right)$
- (d)  $\ln(2x - 3y + z)$
- (e)  $\ln(x^2 - y^3 + z)$

30. Solve the equation  $\log x + \log(x - 3) = 1$

- (a)  $x = 2$
- (b)  $x = 5$
- (c)  $x = -2$ , and  $x = 5$
- (d)  $x = 2$ , and  $x = -5$
- (e) No solution

31. Find the center and the radius of the circle  $x^2 + 6x + y^2 - 4y + 4 = 0$

- (a) Center: (2, -3), Radius: 4
- (b) Center: (6, -4), Radius: 9
- (c) Center: (-6, 4), Radius: 9
- (d) Center: (3, -2), Radius: 3
- (e) Center: (-3, 2), Radius: 3

32. Find the vertex of the quadratic function  $y = 3x^2 - 12x + 13$

- (a) (-2, 1)
- (b) (-4, 5)
- (c) (2, 1)
- (d) (3, 13)
- (e) (4, 9)

33. Find the horizontal asymptotes, if any, of the function  $f(x) = \frac{3x + 1}{2x - 5}$

- (a)  $y = \frac{3}{2}$
- (b)  $y = -\frac{1}{5}$
- (c)  $x = \frac{2}{3}$
- (d)  $x = \frac{5}{2}$
- (e) No horizontal asymptote

34. Solve the equation  $3e^{5x} - 4 = 13$  and round off the solution to the nearest hundredth.

- (a) 0.35
- (b) 0.38
- (c) 0.41
- (d) 0.44
- (e) 0.47

35. Solve the quadratic equation  $-5x^2 - 2x + 1 = 0$

- (a)  $\left\{-1, \frac{2}{5}\right\}$
- (b)  $\left\{\frac{1+2\sqrt{6}}{5}, \frac{1-2\sqrt{6}}{5}\right\}$
- (c)  $\left\{\frac{-2+\sqrt{6}}{10}, \frac{-2+\sqrt{6}}{10}\right\}$
- (d)  $\left\{\frac{-1+\sqrt{6}}{5}, \frac{-1-\sqrt{6}}{5}\right\}$
- (e) No real solution

36. Which of following has a graph that rises to the left and falls to the right?

- (a)  $F(x) = x^4 - 13x^3 + 4x - 6$
- (b)  $G(x) = 3x^5 + x^4 - 8x + 2$
- (c)  $H(x) = -2x^6 + x^2 + 4x + 8$
- (d)  $J(x) = -4x^7 + x^4 - 3x^2 - 1$
- (e)  $K(x) = 6x^3 - x^2 - 3x + 5$

37. Solve the formula  $S = \frac{1}{2}h(a + b)$  for the variable  $a$

- (a)  $a = S - hb$
- (b)  $a = \frac{2S}{h} - b$
- (c)  $a = \frac{1}{2}h(S + b)$
- (d)  $a = \frac{S - b}{2h}$
- (e)  $a = \frac{2S + hb}{h}$

38. Find the remainder when the polynomial  $f(x) = 2x^{2010} - 3x^{67} + 7x - 5$  is divided by  $x + 1$

- (a) -7
- (b) 5
- (c) 3
- (d) -2
- (e) 0

39. Lindsay deposited \$25,000 in a saving account. The APR of the account is 3.5% and the interest is compounded continuously. If Lindsay makes no further deposit, what will be the account's accumulated value after 10 years?

- (a) \$35,369.45
- (b) \$35,422.72
- (c) \$35,458.62
- (d) \$35,476.09
- (e) \$35,476.69

40. Find the solution of the system of equations  $\begin{cases} 2x - 3y = 5 \\ x + 4y = 8 \end{cases}$

- (a) (4, 1)
- (b) (1, -1)
- (c) (0, 2)
- (d) (-1, 1)
- (e) (-4, 3)