

## Semester I Final - Calculator

Date \_\_\_\_\_ Period \_\_\_\_\_

**For each problem, find the average rate of change of the function over the given interval.**

36)  $f(x) = 2x^2 + 2$ ;  $[-1, -\frac{3}{4}]$

A)  $-\frac{7}{2}$       B)  $-14$

C)  $-\frac{7}{4}$       D)  $-\frac{7}{6}$

**Perform the indicated operation.**

37)  $f(x) = 3x - 2$   
 $g(x) = x^2 - 4x$   
 Find  $(f - g)(9)$

A)  $-100$       B)  $-10$   
 C)  $-20$       D)  $20$

38)  $g(x) = 2x - 5$   
 $h(x) = x^2 + 5$   
 Find  $(g + h)(x - 3)$

A)  $x^2 - 4x + 3$   
 B)  $x^2 - 6x + 8$   
 C)  $x^2 - 8x + 15$   
 D)  $x^2 + 6x + 8$

**Divide. Write your answer in fraction form.**

39)  $(10x^5 + 6x^4 - 6x^3 + 2x^2 + 5x + 10) \div (x + 1)$

A)  $10x^4 - 4x^3 - 2x^2 + 4x + 1 - \frac{4}{x + 1}$

B)  $10x^4 - 4x^3 - 2x^2 + 4x + 1 - \frac{6}{x + 1}$

C)  $10x^4 - 4x^3 - 2x^2 + 4x + 1 + \frac{9}{x + 1}$

D)  $10x^4 - 4x^3 - 2x^2 + 4x + 1 + \frac{4}{x + 1}$

40)  $(10x^4 + 11x^3 - 22x^2 - 8x + 10) \div (x + 2)$

- A)  $10x^3 - 9x^2 - 4x - \frac{12}{x+2}$   
 B)  $10x^3 - 9x^2 - 4x + \frac{12}{x+2}$   
 C)  $10x^3 - 9x^2 - 4x - \frac{9}{x+2}$   
 D)  $10x^3 - 9x^2 - 4x + \frac{10}{x+2}$

**Write a polynomial function of least degree with integral coefficients that has the given zeros.**

42)  $-\frac{2}{3}, 3, -\frac{1}{2}$

- A)  $f(x) = 6x^3 - 11x^2 - 11x - 6$   
 B)  $f(x) = 6x^3 - 19x^2 - 19x - 6$   
 C)  $f(x) = 6x^3 - 11x^2 - 19x - 6$   
 D)  $f(x) = 6x^3 - 11x^2 - 25x - 6$

**Use a calculator to approximate each to the nearest thousandth.**

44)  $\log_3 42$

- A) 2.016      B) 4.933  
 C) 3.574      D) 3.402

**Solve each equation. Round your answers to the nearest ten-thousandth.**

46)  $9 \cdot 20^{3n} = 2$

- A) -0.5014      B) -0.2177  
 C) -0.1674      D) -0.4902

**Solve each equation.**

47)  $\log_7 (4x + 7) = \log_7 5x$

- A)  $\{6\}$       B)  $\{7\}$   
 C)  $\{4\}$       D)  $\{12\}$

**Evaluate  $f(x)$  at  $k$ .**

41)  $f(x) = 6x^3 + 15x^2$   
 $k = -1$

- A) -9      B) -10  
 C) 10      D) 9

**Solve each equation.**

43)  $\left(\frac{1}{4}\right)^{-2n} = 16^{-n+3}$

- A)  $\{-1\}$       B)  $\{1\}$   
 C)  $\{-9\}$       D)  $\left\{\frac{3}{2}\right\}$

**Find the inverse of each function.**

45)  $y = \frac{5^x}{3}$

- A)  $y = \log_5 3x$   
 B)  $y = \log_6 (x + 7)$   
 C)  $y = \log_4 (x + 5)$   
 D)  $y = \log_2 4x$

48)  $\log_3 6 - \log_3 (x - 1) = 4$

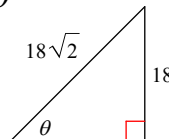
- A) No solution.      B)  $\left\{\frac{29}{27}\right\}$   
 C)  $\left\{-\frac{70}{19}\right\}$       D)  $\left\{\frac{1}{7}\right\}$

49) Matt invests \$3,573 in a retirement account with a fixed annual interest rate of 7% compounded continuously. What will the account balance be after 16 years?

- A) \$10,108.79      B) \$10,787.69  
C) \$10,950.72      D) \$11,744.74

**Find the value of the trig function indicated.**

50)  $\sin \theta$



- A)  $\frac{2\sqrt{21}}{21}$       B)  $\sqrt{2}$   
C)  $\frac{\sqrt{2}}{2}$       D) 1

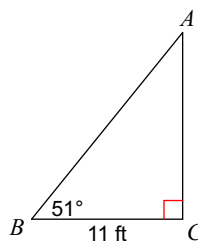
**In each triangle ABC, angle C is a right angle. Find the value of the trig function indicated.**

51) Find  $\cot A$  if  $a = 4$ ,  $c = 4\sqrt{2}$

- A) 1      B)  $\frac{\sqrt{2}}{2}$   
C)  $\sqrt{2}$       D)  $\frac{5\sqrt{13}}{17}$

**Solve each triangle. Round answers to the nearest tenth.**

52)



- A)  $m\angle A = 39^\circ$ ,  $b = 13.6$  ft,  $c = 17.5$  ft  
B)  $m\angle A = 38.4^\circ$ ,  $b = 13.6$  ft,  $c = 17.5$  ft  
C)  $m\angle A = 40.5^\circ$ ,  $b = 13.6$  ft,  $c = 17.5$  ft  
D)  $m\angle A = 39.8^\circ$ ,  $b = 13.6$  ft,  $c = 17.5$  ft

**Find the exact value of each expression.**

53)  $\sec \sin^{-1} \frac{7}{10}$

- A)  $\frac{10\sqrt{51}}{51}$       B)  $\frac{10}{7}$   
C)  $\frac{\sqrt{51}}{10}$       D)  $\frac{7\sqrt{51}}{51}$

54)  $\cos \sin^{-1} \frac{5}{9}$

- A)  $\frac{\pi}{2}$       B)  $\frac{5}{9}$   
C)  $\frac{2\sqrt{14}}{9}$       D) 0

**Write each trigonometric expression as an algebraic expression.**

55)  $\cot \cos^{-1} x$

- A)  $\frac{\sqrt{1+x^2}}{x}$       B)  $\frac{1}{x}$   
C)  $\frac{x}{\sqrt{1+x^2}}$       D)  $\frac{x}{\sqrt{1-x^2}}$

56)  $\cos \tan^{-1} x$

- A)  $\frac{x}{\sqrt{1-x^2}}$       B)  $\frac{\sqrt{1-x^2}}{x}$   
C)  $\frac{1}{\sqrt{1+x^2}}$       D)  $\sqrt{1-x^2}$

## Answers to Semester I Final - Calculator (ID: 1)

36) A  
40) D  
44) D  
48) B  
52) A  
56) C

37) C  
41) D  
45) A  
49) C  
53) A

38) A  
42) C  
46) C  
50) C  
54) C

39) C  
43) D  
47) B  
51) A  
55) D