AB CALCULUS
ALGEBRA REVIEW

SOLVE FOR x

4. $(x+2)(x-5)=(x-1)(x-3)$

5. $(2x-5)(x-4)+2x(1-x)=0$

FACTOR

6. $6a^2-9ab-15b^2$

7. $18x-8x^3$

8. $15r^3+20r^2s-20rs^2$

9. $6ab+9a^2b-15a^3b$

10. $5a^2+10ab+5b^2$

11. $6c^2+18cd+12d^2$

12. $3xy^2-27x^3$

13. $a^3-2a^2b+3a^2-6ab$

14. a^4-b^4

15. $8a^3+4a^2b-2ab^2-b^3$

16. $a(a+2)(a-3)-8(a-3)$

SIMPLIFY

17. $\dfrac{1}{2x^2}-\dfrac{5}{4x}$

18. $\dfrac{x}{x+y}+\dfrac{y}{x-y}$

19. $\dfrac{d+2}{d^2-1}-\dfrac{3}{2d+2}$

WRITE AS A FRACTION IN SIMPLEST FORM

20. $y^2 - \frac{3y+1}{y+2}$

21. $\frac{b-1}{b} - \frac{3}{b-2} + 1$

22. $\left(\frac{m}{n} - \frac{n}{m}\right) \div \left(\frac{1}{m} + \frac{1}{n}\right)$

23. $z + \frac{z-1}{z+1} + 1$

24. $\frac{v+4}{v+2} - \frac{v+2}{v+4}$

25. $\frac{3a+b}{a^2-b^2} - \frac{1}{a+b}$

DIVIDE USING LONG DIVISION OR SYNTHETIC DIVISION

26. $\dfrac{x^2 - x - 12}{x - 4}$

27. $\dfrac{9y^2 + 1}{3y - 1}$

28. $\dfrac{n^3 - 2n^2 + n + 2}{n + 2}$

29. $\dfrac{z^4 + 16}{z^2 + 2}$

SIMPLIFY THE FOLLOWING RADICALS, RATIONALIZING THE DENOMINATOR IF NECESSARY.

30. $\left(3\sqrt{2}\right)\left(-2\sqrt{8}\right)\left(3\sqrt{27}\right)$

31. $\left(2\sqrt{3y^3}\right)^3\left(\sqrt{y^5}\right)$

32. $\dfrac{\sqrt{2}}{\sqrt{5}}$

33. $\dfrac{\sqrt{7}}{\sqrt{15}}$

34. $-11\sqrt{8} - 7\sqrt{12}$

35. $\sqrt{3} - \sqrt{\dfrac{1}{3}}$

SIMPLIFY. EXPRESS ANSWERS WITH POSITIVE EXPONENTS ONLY.

36. $3^7 \cdot 9^{-4}$

37. $\left(2^{-3}\right)^{-1}$

38. $\dfrac{\left(2^{-3} \cdot 4^2\right)^{-1}}{2^{-1}}$

39. $\left(\dfrac{2n^{-2}}{3n}\right)^{-4}$

40. $3x^{-2} \cdot \left(3x^2\right)^{-1}$

41. $\dfrac{d^{-3}}{d^{-5}}$

EXPRESS IN EXPONENTIAL FORM

42. $\sqrt[7]{5}$

43. $\left(\sqrt[4]{3}\right)^5$

SIMPLIFY

44. $27^{1/3}$

45. $81^{3/4}$

46. $125^{4/3}$

SOLVE THE FOLLOWING QUADRATIC EQUATIONS

47. $n^2 + 8n = -15$

48. $5r^2 = 80$

49. $2x^2 + 3x - 20 = 0$

50. $5y^2 - 44y + 120 = -30 + 11y$

SOLVE USING A QUADRATIC EQUATION

51. The width of a rectangular park is 5 m shorter than its length. If the area of the park is 300 m^2, find the length and the width.

52. If the sides of a square are increased by 3 cm, its area becomes 100 cm^2. Find the length of the sides of the original square.

53. Holly has a rectangular garden that measures 12 m by 14 m. She wants to increase the area to 255 m^2 by increasing the width and length by the same amount. What will be the dimensions of the new garden?

AB CALCULUS
PRECALC REVIEW

WRITE THE EQUATION FOR THE SPECIFIED LINE

54. Through (-3, 6) and (1, -2)

55. The horizontal line through (2, -3)

56. The vertical line through (2, -3)

57. Through (3, 1) and parallel to 2x – y = -2

58. Through (-2, -3) and perpendicular to 3x – 5y = 1

DRAW THE GRAPH OF THE FOLLOWING FUNCTIONS

59. $y = -|x-3|+2$

63. $y = |2x-4|+1$

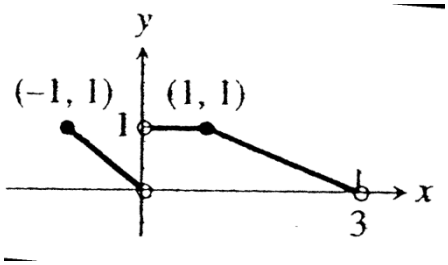
64. $f(x) = \begin{cases} 3-x, & x \le 1 \\ 2x, & 1 < x \end{cases}$

65. $f(x) = \begin{cases} 1, & x < 0 \\ \sqrt{x}, & 0 \le x \end{cases}$

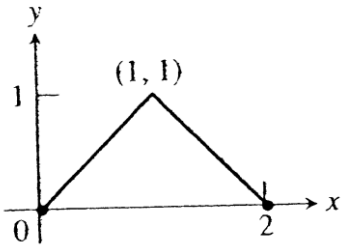
66. $f(x) = \begin{cases} x^2, & x < 0 \\ x^3, & 0 \le x \le 2 \\ 2x-1, & 2 < x \end{cases}$

WRITE A PIECEWISE FORMULA FOR THE GIVEN FUNCTION

67. .



68.



FOR EACH PAIR OF FUNCTIONS FIND:

$f \circ g(x)$ $\quad$ $f \circ g(4)$

$g \circ f(x)$ $\quad$ $g \circ f(4)$

$g \circ g(x)$ $\quad$ $g \circ g(4)$

69. $f(x) = x + 5$ $\quad$ $g(x) = x^2 - 3$

70. $f(x) = x + 1$ $\quad$ $g(x) = x - 1$

71. $f(x) = 1 - x^2$ $\quad$ $g(x) = \sqrt{x}$

Algebraically, find the intersection of the following

72. $3x - 5y = 9$ $\quad$ $x + y = 3$

73. $y = x^2 - 16$ $y = x - 1$

74. $2x + y = 10$ $y = 9 - x^2$

REWRITE THE EXPONENTIAL EXPRESSION TO HAVE THE INDICATED BASE

75. $y = 9^{2x}$ base 3

76. $y = 16^{3x}$ base 2

77. $y = (1/8)^{2x}$ base 2

78. $y = (1/64)^{x}$ base 4

SOLVE FOR x.

79. $1600 = e^{5x}$

80. $\ln(3x) = 10$

81. $10e^{x} - 5 = 125$

82. $-\ln(2x) = \frac{1}{2}$

83. $(1.5)^{x} = 2$

84. $5(3^{x}) = 1$

85. $-2\log(7x) = 2$

86. $\log_2(x) + \log_2(x-1) = 1$

FIND THE INVERSE FUNCTION f^{-1} FOR THE FOLLOWING

87. $f(x) = 2x + 3$

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

89. $f(x) = x^{2/3}$, $x \geq 0$

90. $f(x) = x^2 + 2x + 1$, $x \geq 1$

TRIG FUNCTIONS FOR COMMON ANGLES

You are expected to **memorize** the trig function values (sin, cos, tan) for the common angles listed below. All angles are in radians.

91. Fill in the following chart **WITHOUT** a calculator!! EXACT answers ONLY!

θ	**0**	$\frac{p}{6}$	$\frac{p}{4}$	$\frac{p}{3}$	$\frac{p}{2}$	p	$\frac{3p}{2}$	$2p$
Sinθ								
Cosθ								
Tanθ								

92. Find the value **WITHOUT** a calculator! value

Find the exact numerical value:

a) $\cos\frac{\pi}{3}-\sin\frac{3\pi}{2}$

b) $\sin 2\pi+\cos\pi$

c) $\sin\frac{\pi}{2}+\cos\frac{\pi}{4}$

d) $\tan\frac{\pi}{4}-\sin\frac{\pi}{2}$

e) $-\cos(-\pi)+\sin\left(-\frac{3\pi}{2}\right)$

f) $\csc\frac{\pi}{3}+\sec\frac{\pi}{6}$

g) $\sin\frac{3\pi}{2}-\cos 3\pi$

h) $\tan\frac{\pi}{3}+\tan\frac{\pi}{6}$

i) $\sin\frac{3\pi}{4}-\cos\frac{5\pi}{4}$

j) $\tan\frac{5\pi}{4}+\cos 0$

k) $\cos\left(-\frac{\pi}{4}\right)+\sin\frac{2\pi}{3}$

l) $\left(\cot\frac{\pi}{6}\right)\left(\cos\frac{7\pi}{4}\right)$

93. Solve each equation for $0 \le q < 2p$ without the use of your graphing calculator.

a) csc**θ**=2 b) tan**θ +4 = 5** **c) 2cosθ = -1**

94. Sketch the graphs the following functions without a calculator! You will be expected to know these graphs without the use of your graphing calculator!

a) y = sinx
b) y = cosx
c) y=tanx
d) y=1/x
e) $y=1/x^2$
f) $y = x^2$
g) $y= x^3$
h) $y = \sqrt{x}$
i) $y = \sqrt[3]{x}$
j) $y = x^{3/2}$
k) $y = x^{2/3}$

95.

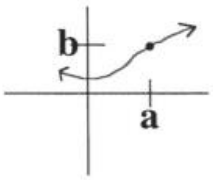
CH.1 LIMITS

** When evaluating limits, we are checking around the point that we are approaching, NOT at the point.

**Every time we find a limit, we need to check from the left and the right hand side
(Only if there is a BREAK at that point).

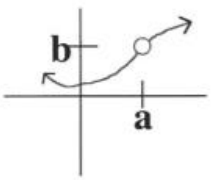
1-2 Finding Limits Graphically and Numerically

No breaking point



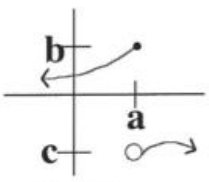
$\lim_{x \to a} f(x) =$

Hole in the graph



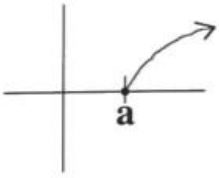
$\lim_{x \to a} f(x) =$

piece-wise function



$\lim_{x \to a} f(x) =$
$\lim_{x \to a^+} f(x) =$
$\lim_{x \to a^-} f(x) =$

radicals



$\lim_{x \to a} f(x) =$
$\lim_{x \to a^+} f(x) =$
$\lim_{x \to a^-} f(x) =$

96.

1-3 Analyzing Limits Analytically

LIMITS AT NON-BREAKING POINTS (Very easy. Just plug in the #)

EX#1: $\lim_{x\to 1} x^2 =$ **EX#2:** $\lim_{x\to 5} \sqrt{x+4} =$ **EX#3:** $\lim_{x\to 1} \frac{x-1}{x+1} =$

HOLES IN THE GRAPH $\left(\frac{0}{0}\right)$ (Factor and cancel or multiply by the conjugate and cancel, then plug in #)

EX#1: $\lim_{x\to 3} \frac{x^2+3x-18}{x-3} =$ **EX#3:** $\lim_{x\to -4} \frac{\sqrt{x+5}-1}{x+4} =$

EX#2: $\lim_{x\to 4} \frac{x-4}{x-4} =$ **EX#4:** $\lim_{x\to 25} \frac{\sqrt{x}-6}{36-x} =$