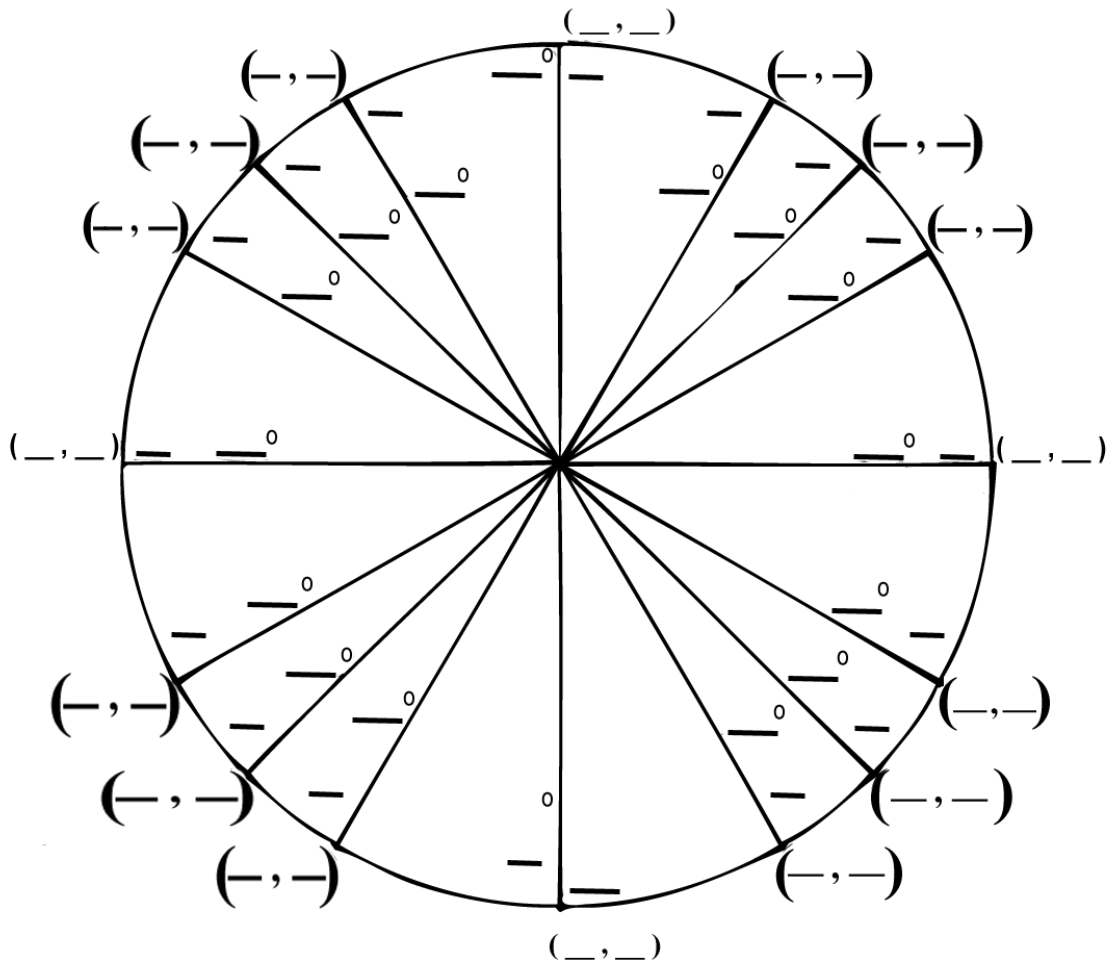


Summer Assignment for AP Calculus

Know your Unit Circle inside and out! Especially the radians!

Complete the following sheet below.

# Unit Circle, Fill in the blank



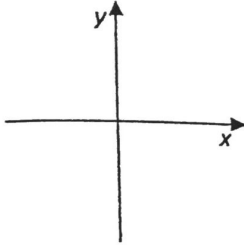
[www.mathwarehouse.com/unit-circle](http://www.mathwarehouse.com/unit-circle)

**CONCEPTS WORKSHEET****Graphical Analysis**

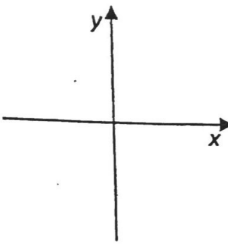
Chapter 1 deals with functions and their characteristics. To facilitate a study of functions, it is important to visualize mentally the graphical image of a function when given an algebraic description.

I. Graph each function. Clearly indicate units on the axes provided.

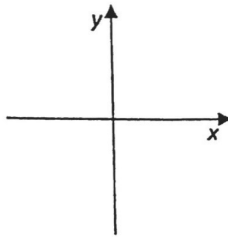
1.  $f(x) = x$



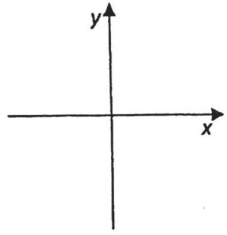
2.  $f(x) = x^2$



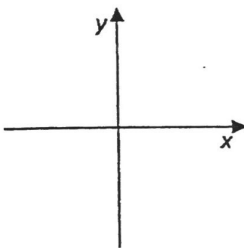
3.  $f(x) = x^3$



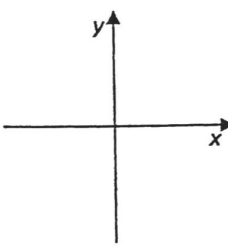
4.  $f(x) = |x|$



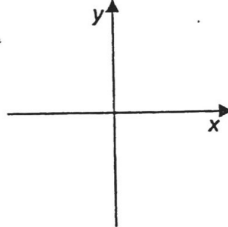
5.  $f(x) = [x]$



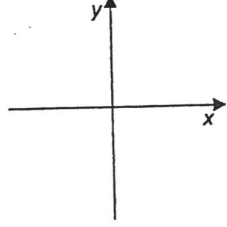
6.  $f(x) = \sin x$



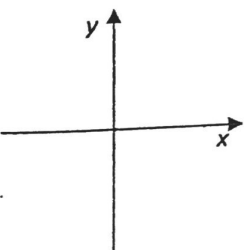
7.  $f(x) = \cos x$



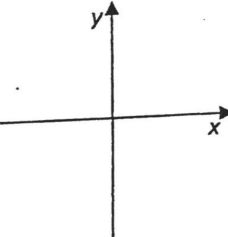
8.  $f(x) = \tan x$



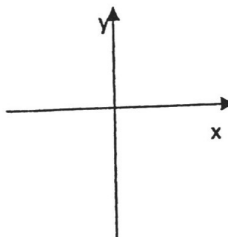
9.  $f(x) = \sec x$



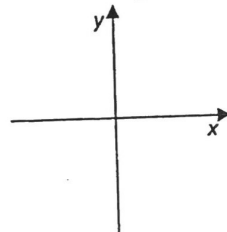
10.  $f(x) = 2^x$



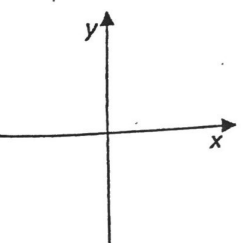
11.  $f(x) = \log_2 x$



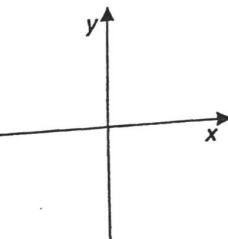
12.  $f(x) = \frac{1}{x}$



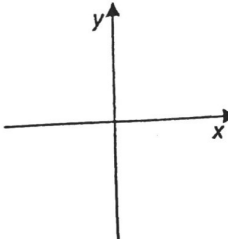
13.  $f(x) = \frac{1}{x^2}$



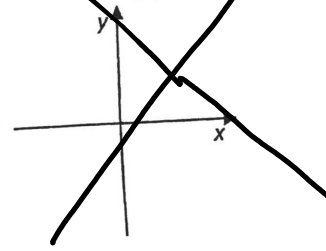
14.  $f(x) = \sqrt{x}$



15.  $f(x) = \sqrt{a^2 - x^2}$



16.  $f(x) = \begin{cases} 0, & \text{if } x \text{ is rational} \\ 1, & \text{if } x \text{ is irrational} \end{cases}$





### Exponent Rules Review Worksheet

**NOTE:** Anything to the zero power equals 1!

**Product Rule:** When multiplying monomials that have the same base, add the exponents.

$$x^m \cdot x^n = x^{m+n}$$

Example 1:  $x \cdot x^3 \cdot x^4 = x^{1+3+4} = x^8$     Example 2:  $(2x^2y)(-3x^3y^4) = 2 \cdot (-3) \cdot x^2 \cdot x^3 \cdot y \cdot y^4 = -6x^5y^5$

**Power Rule:** When raising monomials to powers, multiply the exponents.

$$(x^m)^n = x^{m \cdot n}$$

Example 3:  $(x^2y^3)^4 = x^{2 \cdot 4} y^{3 \cdot 4} = x^8y^{12}$     Example 4:  $(2x^3yz^2)^3 = 2^3 x^{3 \cdot 3} y^3 z^{2 \cdot 3} = 8x^9y^3z^6$

**Quotient Rule:** When dividing monomials that have the same base, subtract the exponents.

$$\frac{x^m}{x^n} = x^{m-n}$$

Example 5:  $\frac{x^3}{x^{-2}} = x^{3-(-2)} = x^5$     Example 6:  $\frac{5^6}{5^2} = 5^{6-2} = 5^4$     Example 7:  $\frac{36m^3n^5}{-9mn^4} = \frac{36}{-9} \cdot \frac{m^3}{m} \cdot \frac{n^5}{n^4} = -4m^2n$

---

**Simplify each of the following. Copy the problem. Work on your own paper.**

1)  $a \cdot a^2 \cdot a^3$     2)  $(2a^2b)(4ab^2)$     3)  $(6x^2)(-3x^5)$     4)  $b^3 \cdot b^4 \cdot b^7 \cdot b$     5)  $(3x^3)(3x^4)(-3x^2)$

6)  $(2x^2y^3)^2$     7)  $(5x^2y^4)^3$     8)  $(6x^4y^6)^3$     9)  $(4x^3y^3)^3$     10)  $(7xy)^2$

11)  $\frac{x^3}{x}$     12)  $\frac{18c^3}{-3c^2}$     13)  $\frac{9a^3b^5}{-3ab^2}$     14)  $\frac{-48c^2d^4}{-8cd}$     15)  $\frac{22y^6z^8}{2yz^{-7}}$

16)  $x^2 \cdot x^7$     17)  $(x^2)^7$     18)  $(-2x^4)^5$     19)  $2x^3 + 7x^3$     20)  $7^0$

21)  $8x^0$     22)  $-3^4$     23)  $(-3)^4$     24)  $6x^0y^8 - (2y^2)^4$     25)  $(x+2y)(x-2y)$

26)  $\frac{2x^3}{-8x^4}$     27)  $\frac{xy^7}{x^3y^4}$     28)  $6x^5 \cdot 3x^5 \cdot x^0$     29)  $(3st^{12})^3$     30)  $\left(\frac{3m^2n^7}{m}\right)^5$

In Problems 63–82, solve each equation.

63.  $7^x = 7^3$

67.  $\left(\frac{1}{5}\right)^x = \frac{1}{25}$

71.  $3^{3^x} = 9^x$

64.  $5^x = 5^{-6}$

68.  $\left(\frac{1}{4}\right)^x = \frac{1}{64}$

72.  $4^{x^2} = 2^x$

65.  $2^{-x} = 16$

69.  $2^{2x-1} = 4$

73.  $8^{-x+14} = 16^x$

66.  $3^{-x} = 81$

70.  $5^{x+3} = \frac{1}{5}$

74.  $9^{-x+15} = 27^x$

**Evaluate each expression.**

1)  $2 \log_5 25 - \log_4 16$

Answer

2)  $\log_9 \left(\frac{1}{3}\right) \cdot \log_7 49$

Answer

3)  $\frac{\log_3 27}{2 \log_2 4}$

Answer

4)  $\log_6 36 + 5 \log_9 81$

Answer

5)  $\left(\frac{1}{2}\right) \log_2 16 - \log_4 64$

Answer

6)  $\log_5 125 \cdot \log_2 32$

Answer

7)  $\frac{2 \log_4 16}{\log_7 49}$

Answer

8)  $\left(\frac{1}{3}\right) \log_3 27 + \log_8 64$

Answer

9)  $\log_9 729 - 2 \log_2 128$

Answer

10)  $\log_6 216 \cdot \log_5 125$

Answer