Name: _____ Period: ____

Are you ready for Calculus?

Review prerequisite skills: Problems involving Linear Equations in Two Variables, Domain, Range and Graphing Functions (quadratic, absolute value, square root, exponential, natural log, piecewise), Rational Functions, Composite and Inverse Functions, Trigonometry, Word Problems, and the Unit Circle.

Back to School Packet

By: Teaching from A-Z © 2019
Clipart by The Digital Bake Shop

Name _____ Date _____ Period _____

Are You Ready for Calculus? Page 1

Prerequisite Skills

Part I. Review. Fill in the formulas/information below to serve as your study guide.

Distance Formula:

Slope Formula:

Equations of lines:

Vertical Line:

Horizontal Line:

Slope-Intercept Form:

Point-Slope Form:

Standard Form:

Parallel and Perpendicular Lines:

Parallel lines have the _____slope.
Perpendicular lines have slopes that are _____

Trigonometric Ratios:

- $\sin\theta =$
- $\cos\theta =$
- $\tan\theta =$
- $\csc\theta =$
- $\sec\theta =$
- $\cot\theta =$

Trigonometric Pythagorean Identities

1. 2. 3.

Name _____ Date _____ Period _____

Are You Ready for Calculus? Page 2

Prerequisite Skills

Part I. Review. Fill in the formulas/information below to serve as your study guide.

Properties of Logarithms:

1. Product:

2. Quotient:

3. Power:

Graph $y = \ln x$ and $y = e^x$

$y = \ln x$

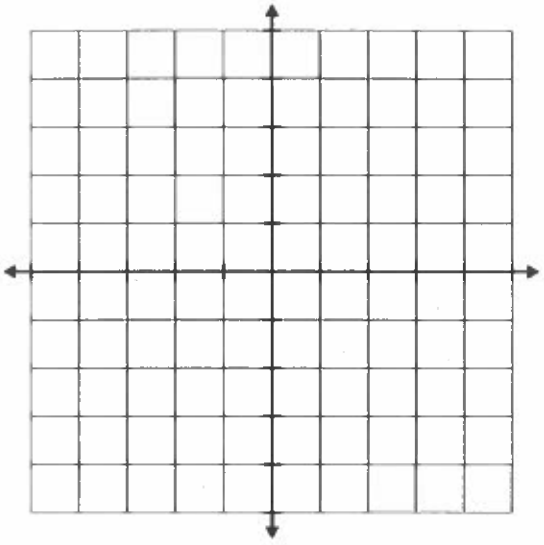
Domain: _____

Range: _____

$y = e^x$

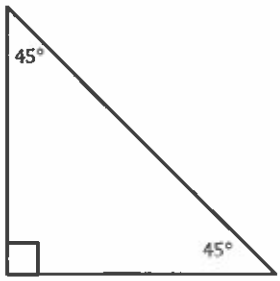
Domain: _____

Range: _____

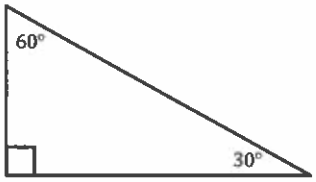


Label 3 Special Right Triangles:

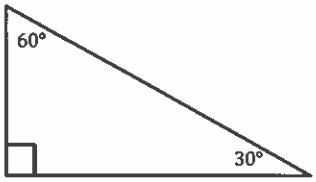
$45° - 45° - 90°$



$30° - 60° - 90°$ (make short leg x)



$30° - 60° - 90°$ (make long leg x)



Name _____ Date _____ Period _____

Are You Ready for Calculus? Page 3

Prerequisite Skills

Part II. Linear Equations in Two Variables

Directions: Write the equation of the line

1. through $(1, -5)$ with slope 4	**2.** the vertical line through $(0, -2)$	**3.** the horizontal line through $(5, -4)$
4. through the points $(5, -6)$ *and* $(1, -3)$	**5.** through $(3, 3)$*and* $(-4, 5)$	**6.** through $(4, 9)$*and* parallel to $2x - y = 4$
7. through $(-5, -6)$ *and* perpendicular to $3x - 5y = 2$	**8.** through $(-1, 3)$*and* perpendicular to $\frac{1}{3}x + \frac{1}{2}y = 4$	**9.** with x – intercept 4 and y – intercept 7

Name _____ Date _____ Period _____

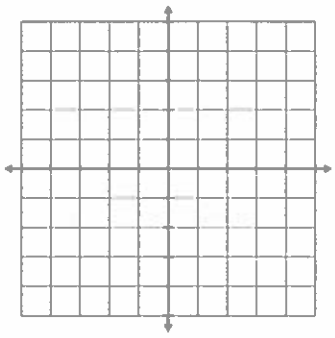
Are You Ready for Calculus? Page 4

Prerequisite Skills

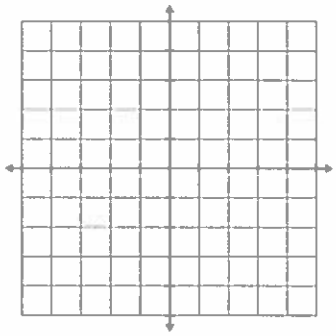
Part III. Functions

Directions: Find the domain and range, and graph.

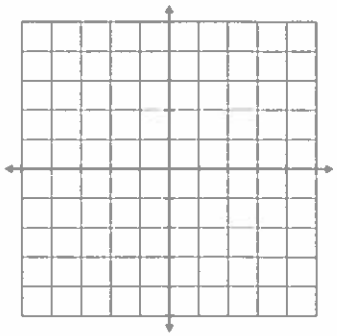
10. $y = 3x^2 + 4$



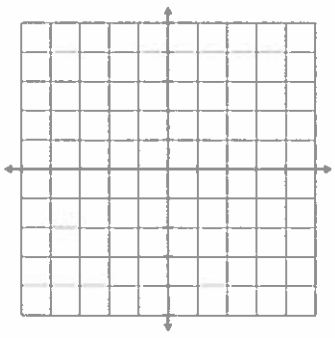
11. $y = |x| - 3$



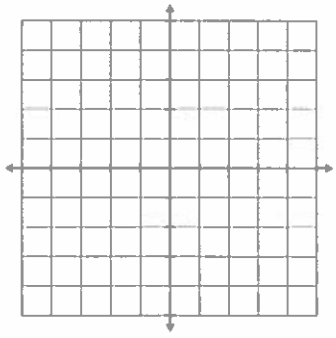
12. $y = -2 + \sqrt{1 - x}$



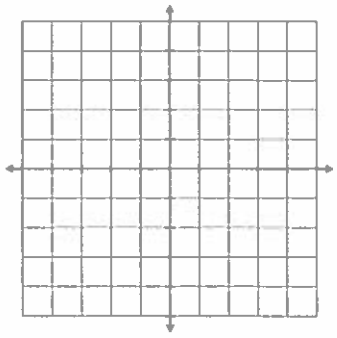
13. $y = 2e^{-x} - 3$



14. $y = \ln(x - 4) + 1$



15. $y = \begin{cases} \sqrt{-x} & for\ -4 \le x \le 0 \\ \sqrt{x} & for\ 0 < x \le 4 \end{cases}$



Name _____ Date _____ Period _____

Are You Ready for Calculus? Page 5

Prerequisite Skills

Directions: Determine whether the graph of these functions is symmetric about the y-axis, the origin or neither.

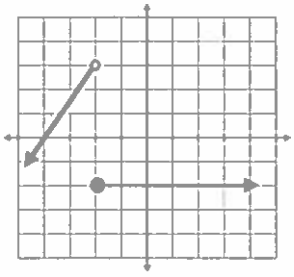
16. $y = x^{\frac{1}{5}}$	**17.** $y = e^{-x^2}$

Directions: Determine whether the function is even, odd or neither.

18. $y = x^2 + 5$	**19.** $y = 1 - \cos x$	**20.** $y = \frac{x^4+1}{x^3-2x}$

Directions: Write a piecewise function for the graph below.

21.



Directions: Simplify the following rational expressions

22. $\frac{x^2+3x-18}{x^3+x^2-12x}$	**23.** $\frac{\frac{1}{x}-\frac{1}{4}}{\frac{1}{x^2}-\frac{1}{16}}$	**24.** $\frac{16-x^{-2}}{4+x^{-1}}$

Name _____ Date _____ Period _____

Are You Ready for Calculus? Page 6

Prerequisite Skills

Part IV. Composite and Inverse Functions

Directions: Read each question. Show all work where needed.

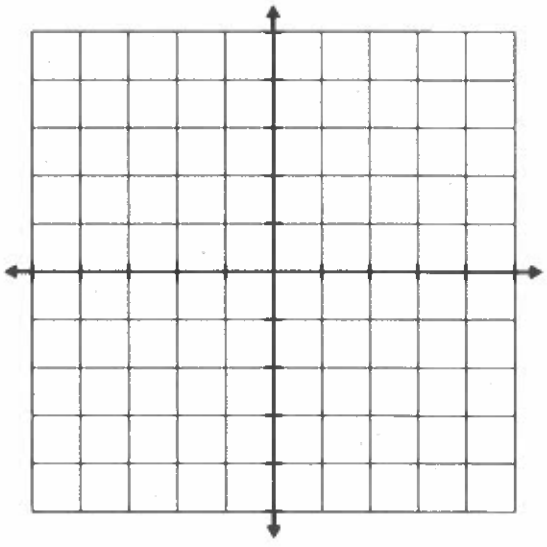
25. If $f(x) = 5 - x^2$ *and* $g(x) = \sqrt{x+3}$,

a) Write a formula for $f \circ g$ and $g \circ f$

b) find the domain and range of each.

26. If $f(x) = 3 - 4x$,

a) Find f^{-1}



b) b) Show that $(f \circ f^{-1})(x) = (f^{-1} \circ f)(x) = x$

c) Graph f and f^{-1} on the same coordinate plane.

Name _____ Date _____ Period _____

Are You Ready for Calculus? Page 7
Prerequisite Skills

Part V. Trigonometry

27. Find the 6 trigonometric values of $\theta = \cos^{-1}\left(\frac{3}{7}\right)$. Write exact answers (no decimals).

Part VI. Word Problems

28. A drug is administered intravenously for pain. The function $f(t) = 90 - 52\ln(1+t), 0 \le t \le 4$ gives the number of units of the drug in the body after t hours.

a) What was the initial number of units of the drug administered?

b) How much is present after 2 hours?

c) Draw the graph of f.

Name _____ Date _____ Period _____

Are You Ready for Calculus? Page 8

Prerequisite Skills

29. The table below shows the number of doctoral degrees earned in the given academic year by Hispanic students. Let $x = 0$ represent 1970-71, $x = 1$ represent 1971-72, and so forth.

Year	Number of Degrees
1976-77	520
1980-81	460
1984-85	680
1988-89	630
1990-91	730
1991-92	810
1992-93	830

(a) Find the linear regression equation for the data and superimpose its graph on a scatter plot of the data.

(b) Use the regression equation to predict the number of doctoral degrees that will be earned by Hispanic Americans in the academic year 2000 - 01.

(c) Find the slope of the regression line. What does the slope represent? (Use complete sentences.)

Name _____ Date _____ Period _____

Are You Ready for Calculus? Page 9

Prerequisite Skills

Part VII. Unit Circle

Directions: Label radians, degrees, and points for EVERY angle on the unit circle below.