acti✂ities

Calculator Graphing

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Teacher's Guide

Grade Level: 7–12

Materials: One set of activity sheets and a hand-held calculator for each student. If you do not have an adequate supply of calculators, students may work in pairs.

Objectives: To provide experience in using calculators to compute squares, reciprocals, and square roots. Experience also is gained in rounding numbers to the nearest hundredth, in plotting points, and in drawing graphs.

Directions: Distribute the activity sheets, one at a time, to each student. Have the students complete sheet 1 before beginning sheet 2.

Sheet 1. This initial activity familiarizes students with using a calculator to compute squares of numbers from zero to one and in rounding off these numbers to the nearest hundredth. A nice extension is to graph the curve $y = x^3$ in the same interval. Some students may be bothered by the fact that the cubes of 0.00, 0.05, 0.10, and 0.15 are each 0.00 when rounded off to the nearest hundredth.

Sheet 2. This activity provides more practice in using the calculator, in rounding off, and in graphing. If your calculators do not have the reciprocal function, these values can be computed by using the division function ($y = 1 \div x$).

Sheet 3. This activity requires calculators with a square-root key. It may be helpful to have your students graph the curve $y = \sqrt{x}$ in the interval $0 \le x \le 1$ before working on this sheet. In completing this activity, have your students round off x^2 to the nearest hundredth. The corresponding values of $\sqrt{1 - x^2}$ are sufficiently accurate when computed from that data. With students who have the appropriate background, you may wish to develop the relationship between the equations $x^2 + y^2 = 1$ and $y = \sqrt{1 - x^2}$. For further study, students may be interested in comparing the graphs of $y = \sqrt{4 - x^2}$ or $y = \sqrt{9 - x^2}$ on the corresponding intervals $0 \le x \le 2$ or $0 \le x \le 3$. For these graphs, change the horizontal scale so that ten to twenty points are generated.
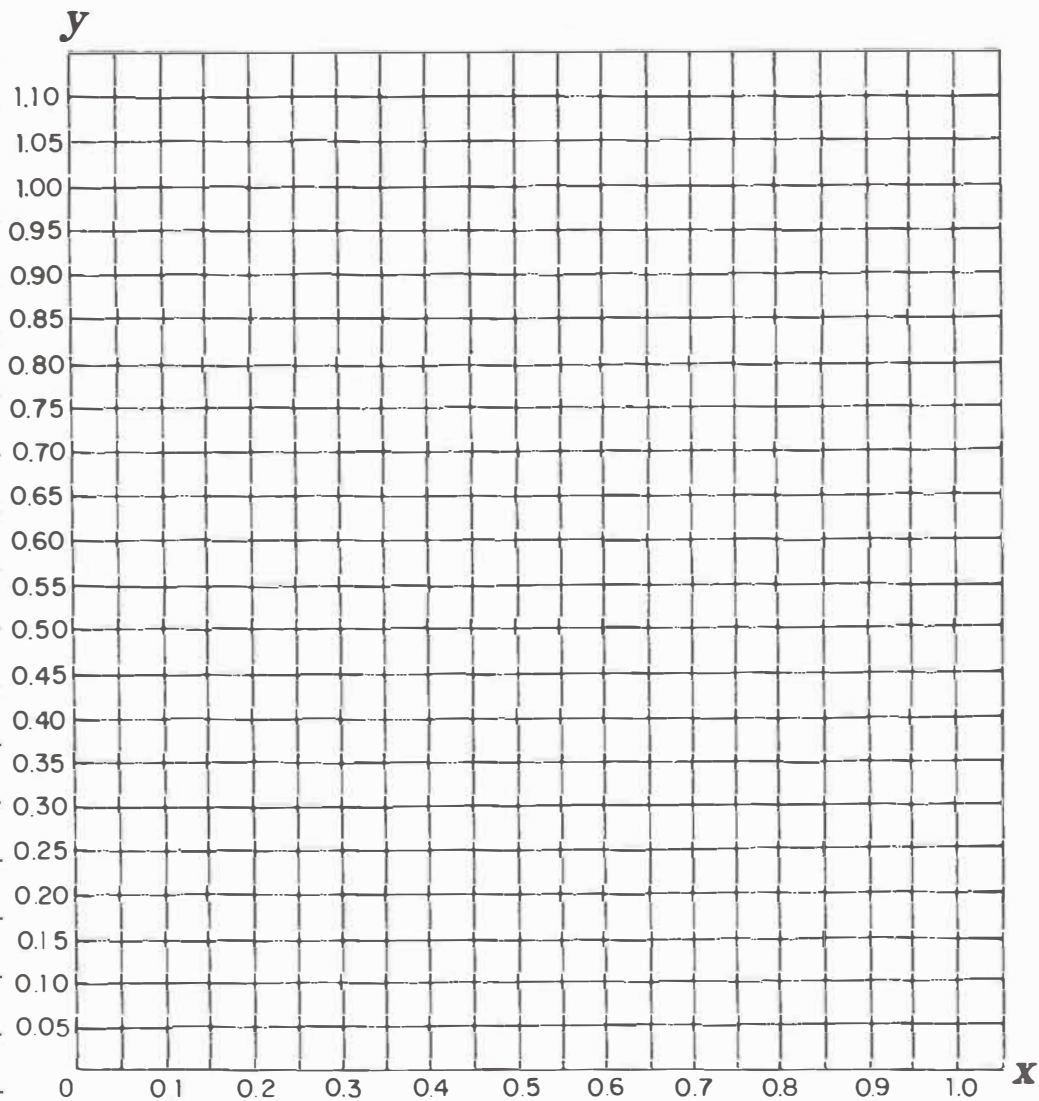
Bibliography

Miller, William A. *Laboratory Activities in Algebra.* Teacher ed. Portland, Maine: J. Weston Walch, Publisher, 1974, pp. T28–T30 and 52–57.

Graphing $y = x^2$

1. Use your calculator to complete the following table. Round off your answers to the nearest hundredth.

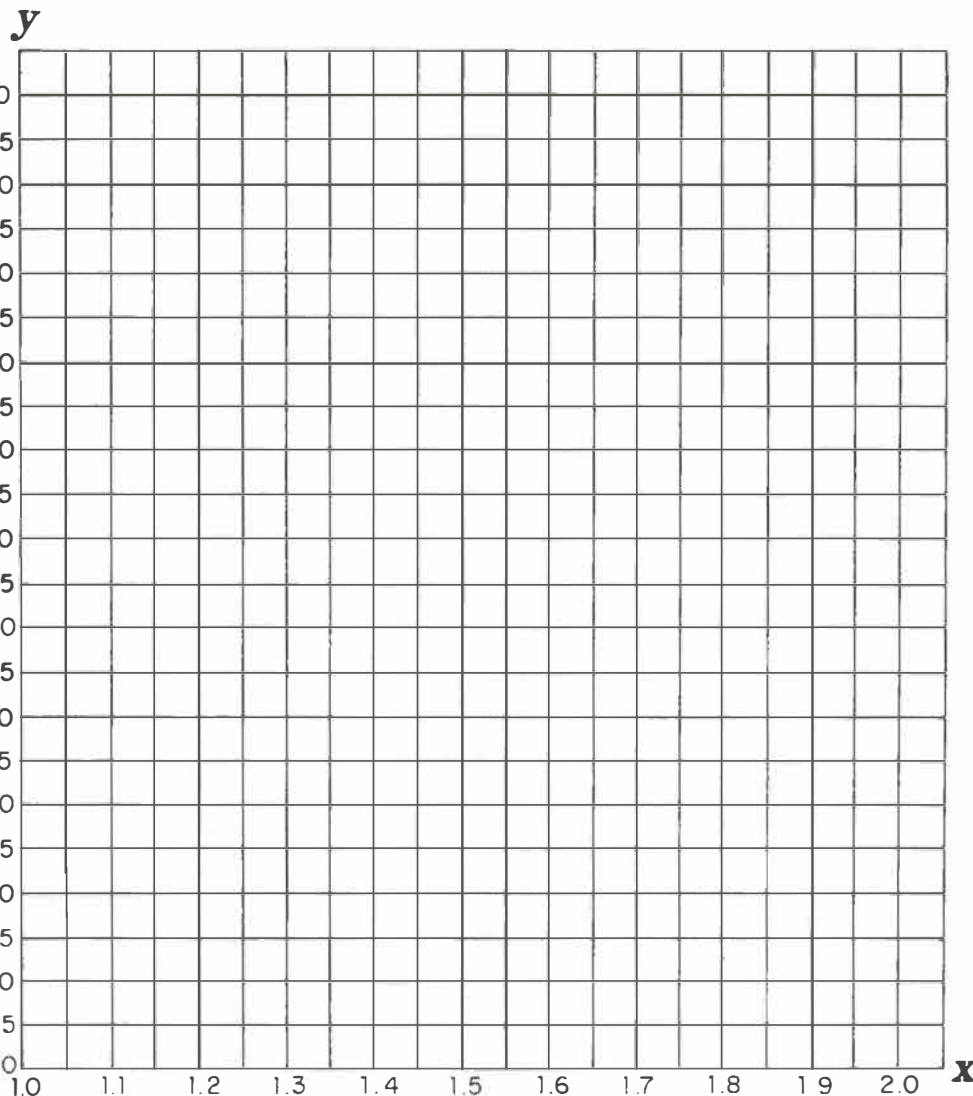| x	$y = x^2$
.00	
.05	
.10	
.15	
.20	
.25	
.30	
.35	
.40	
.45	
.50	
.55	
.60	
.65	
.70	
.75	
.80	
.85	
.90	
.95	
1.00	

2. After you have completed the table, graph the ordered pairs (x , y).

3. Connect the points with a smooth curve to complete the graph.

SHEET 2

Graphing $y = \dfrac{1}{x}$ from 1 to 2

1. Use your calculator to complete the following table. Round
    off your answers to the nearest hundredth.

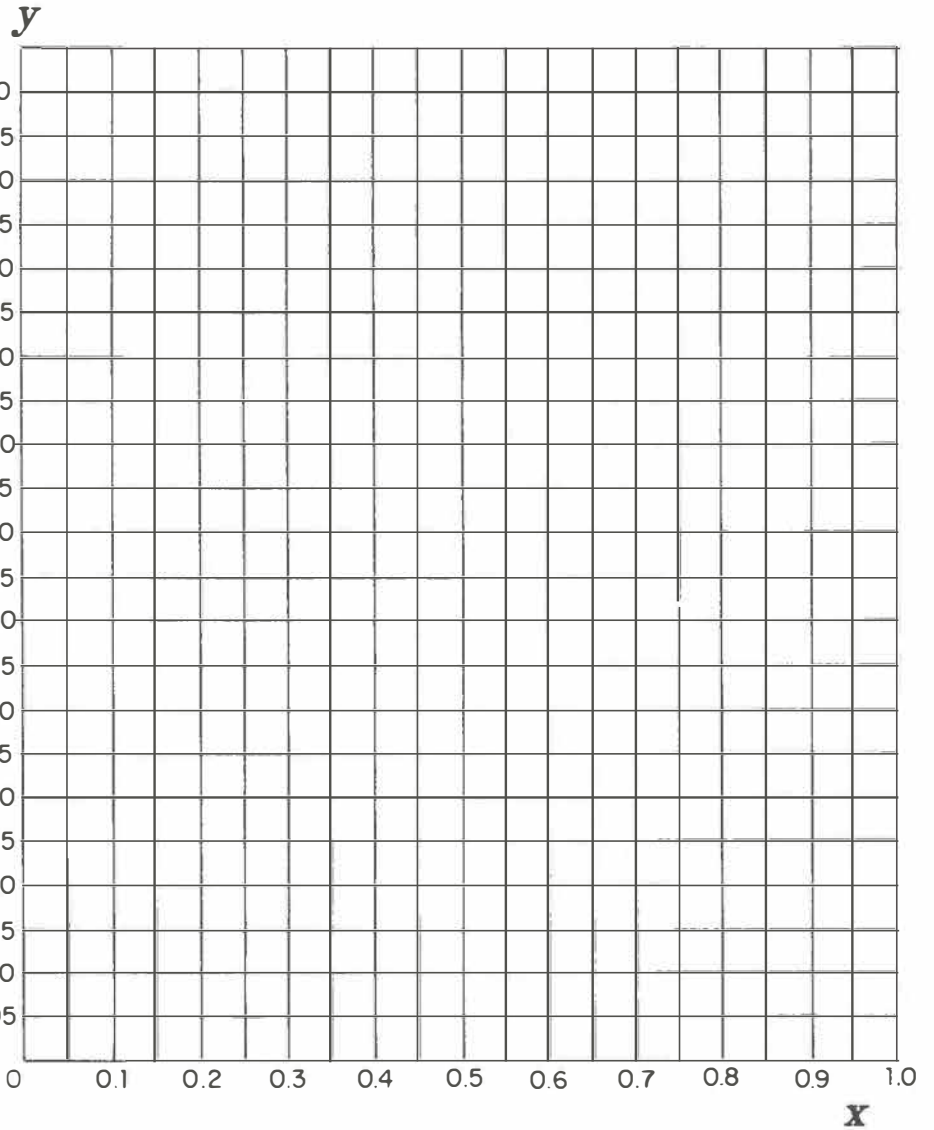| x	$y = \dfrac{1}{x}$
1.00	
1.05	
1.10	
1.15	
1.20	
1.25	
1.30	
1.35	
1.40	
1.45	
1.50	
1.55	
1.60	
1.65	
1.70	
1.75	
1.80	
1.85	
1.90	
1.95	
2.00	

2. After you have completed the table, graph the ordered pairs
    (x , y).

3. Connect the points with a smooth curve to complete the graph.

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SHEET 3

Graphing x² + y² = 1

1. Use your calculator to complete the following table. Round off your answers in each column to the nearest hundredth.

x	x^2	$1-x^2$	$y=\sqrt{1-x^2}$
.00			
.05			
.10			
.15			
.20			
.25			
.30			
.35			
.40			
.45			
.50			
.55			
.60			
.65			
.70			
.75			
.80			
.85			
.90			
.95			
1.00			

2. After you have completed the table, graph the ordered pairs (x , y).

3. Connect the points with a smooth curve to complete the graph.

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