

Summer Assignment for Precalculus Students

- 1) Do all problems on loose leaf paper.

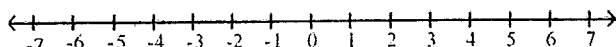
- 2) Skip a line between each problem.
- 3) Work for each problem must be shown.
- 4) If a problem requires a picture use a straight edge to draw a straight line.
- 5) Do some research on the study of Precalculus. Write a report on your findings. The report must be one page typed double spaced. Some of the things your report should contain are:
 - a) What is precalculus?
 - b) Name five major topics studied in a precalculus course.
 - c) Explain two of the topics you have named.
- 6) All work must be presented in a folder or binder.

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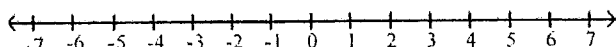
SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Describe and graph the interval of real numbers.

1) $(-1, 3]$



2) $(-\infty, 5]$



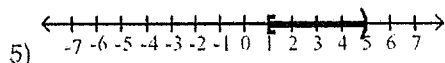
ESSAY. Write your answer in the space provided or on a separate sheet of paper.

Use an inequality to describe the interval of real numbers.

3) x is between -3 and 4 .

Use interval notation to describe the interval of real numbers.

4) $x \leq -7$



Identify the base. Do not evaluate.

6) 6^{14}

7) -4^9

Simplify the expression. Assume that the variables in the denominator are nonzero.

8) $\frac{x^2y^7}{x^5y^3}$

9) $\frac{(3x^4)^3z^2}{3z^5}$

10) $\frac{(x-3y^3)^{-4}}{(y^3x-5)^{-5}}$

11) $\left(\frac{20a^7b^6}{ab^3}\right)\left(\frac{2b^2}{4a^3b^8}\right)$

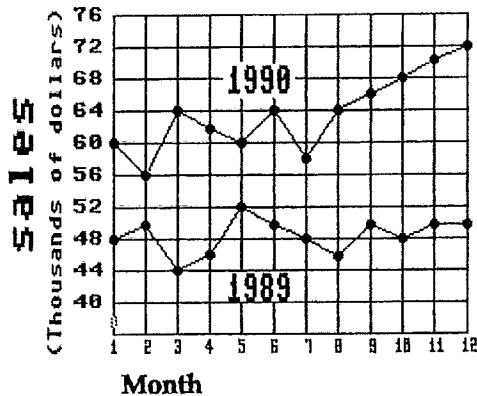
Evaluate the expression.

12) $5 - |-5|$

13) $\frac{-4}{|-4|}$

Use this graph to answer each question.

Big "D" Sales
1989-1990



14) Which month in 1989 had the lowest sales?

15) What were the total sales for the first 6 months of 1990?

16) What was the percent of increase in sales between month 2 and month 12 of 1990? Round your answer to the nearest tenth.

Find an equation for the circle.

17) Center $(-2, 5)$, radius 4

Find the center and radius of the circle.

18) $x^2 + y^2 = 6$

Write the statement using absolute value notation.

19) The distance between x and 1 is 7.

Solve the equation.

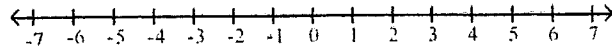
20) $10y = 7y + 3 + 2y$

21) $\frac{1}{5}(10x - 25) = \frac{1}{2}(10x - 4)$

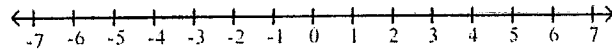
22) $\frac{7x + 7}{5} + \frac{6x - 2}{2} = -1$

Solve the inequality and draw a number line graph of the solution.

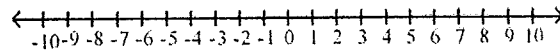
23) $8 < -4b \leq 24$



24) $10 < -4y + 2 \leq 26$



25) $3(4 - 3x) + 3(3x - 4) \geq 2x$



Solve the inequality.

26) $\frac{2y - 3}{3} + \frac{3y + 1}{5} \leq y + 1$

27) $\frac{1}{4}(x + 4) - 4x \leq 4(2 + x)$

Find the slope of the line through the pair of points.

28) (6, 1) and (5, 7)

29) (-7, -4) and (-7, -2)

Find the value of x or y so that the line through the pair of points has the given slope.

30) (-1, 2) and (4, y); $m = -2$

Find a point-slope form equation for the line through the point with the given slope.

31) (-5, 7), $m = -\frac{4}{5}$

Find a general form equation for the line through the pair of points.

32) (-2, 4) and (5, 1)

33) (-1, -4) and (-1, 3)

Find a slope-intercept form equation for the line.

34) $6x - 11y = 48$

35) Through (0, 3), with slope $\frac{5}{3}$

Find the value of x and the value of y for which $(x, 2)$ and $(8, y)$ are points on the graph.

36) $2x + 3y = 5$

Determine the equation of the line described. Put answer in the slope-intercept form, if possible.

37) Through $(5, -3)$, perpendicular to $-8x - 5y = -25$

38) Through $(3, 10)$, parallel to $5x + 6y = 33$

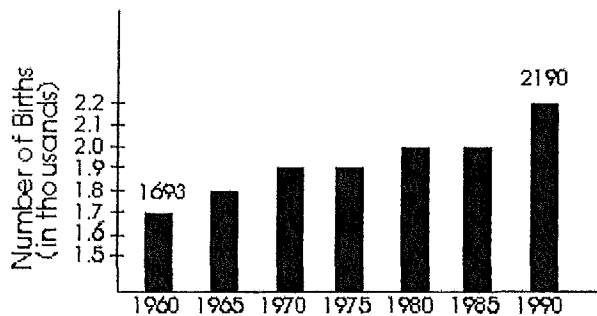
Solve the problem.

39) Suppose the sales of a particular brand of appliance satisfy the relationship $S(x) = 240x + 3700$, where $S(x)$ represents the number of sales in year x , with $x = 0$ corresponding to 1982. Find the number of sales in 1989.

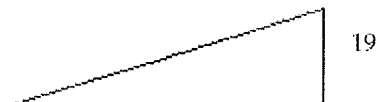
40) Let $C(x) = 200 + 30x$ be the cost to manufacture x items. Find the average cost per item to produce 40 items. Round to the nearest dollar.

41) Employees of a publishing company received an increase in salary of 5% plus a bonus of \$1200. Find the total annual pay after the increase for an initial salary of \$1200.

42) Assume that the situation described can be modeled by a straight line graph. Use the given information to find the $y = mx + b$ form of the equation of the line. The number of births in County A has been increasing in recent years. Use the information given on the bar graph for the years 1960 and 1990. Let $x = 0$ represent the year 1960 and y represent the number of births.



43) A motorcycle daredevil is planning a stunt to perform at a county fair. A ramp must be built to give him a 20% grade, or slope. If the vertical height at the end of the ramp must be 19 ft to assure that the stunt is a success, what must be the length of the horizontal run?



Solve the equation by factoring.

44) $x^2 - x = 20$

45) $24x^2 + 52x + 24 = 0$

$$46) x(2x - 28) = -90$$

Solve the equation by extracting the square roots.

$$47) (r + 4)^2 = 15$$

$$48) 2y^2 - 8 = 4 - 2y^2$$

Solve by completing the square.

$$49) x^2 + 14x + 48 = 0$$

$$50) 25x^2 - 33 = 40x$$

$$51) 2x^2 - 7x + 22 = (x - 2)(x + 1) + 4x$$

Solve the equation using the quadratic formula.

$$52) 7x^2 + 8x = -2$$

$$53) x^2 - 3 = \sqrt{5}x$$

Solve the equation graphically by finding x-intercepts.

$$54) 2x^2 + 11x + 2 = 0$$

Use a method of your choice to solve the equation.

$$55) x + 1 = \frac{11}{x}$$

$$56) x + 1 - 2\sqrt{x + 11} = 0$$

$$57) |x + 5| = |x + 6|$$

Solve the problem.

58) The length of a rectangle is three inches more than the width. The area of the rectangle is 154 inches. Find the width of the rectangle.

59) A rock falls from a tower that is 272 ft high. As it is falling, its height is given by the formula $h = 272 - 16t^2$. How many seconds will it take for the rock to hit the ground ($h=0$)?

60) The number of mosquitoes $M(x)$, in millions, in a certain area depends on the June rainfall x , in inches: $M(x) = 10x - x^2$. What rainfall produces the maximum number of mosquitoes?