Evaluate each function:

1) $k(t) = -3t^2 - 2t$; Find $k(-2)$

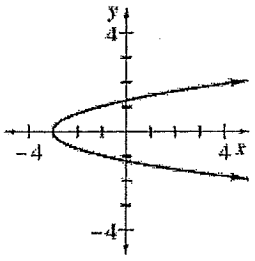
2) $h(x) = 3 \cdot 2^{-x-1}$; Find $h(1)$

3) $w(n) = -2 \cdot 2^n$; Find $w(0)$

4) $p(x) = 3|x-2| + 2$; Find $p(-5)$

Which of the following represent a function? Explain. * To be a function each input (x) must have only one output (y).

5)



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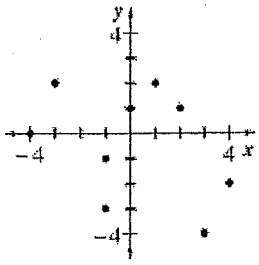

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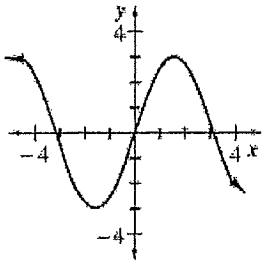

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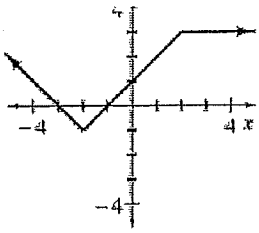


9)

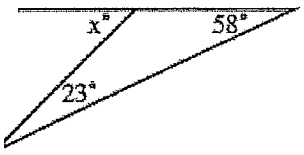
Input (x)	3	-1	2	0	1	2	9
Output (f(x))	4	-5	-8	7	4	-8	2

10)

Input (x)	4	7	45	52	7	13
Output (f(x))	8	8	7	-6	9	0

Use geometric properties and theorems to solve for x in each diagram and write the property or theorem you use in each case.

11)



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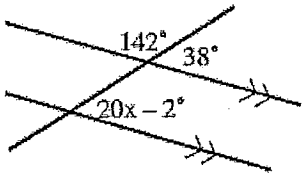

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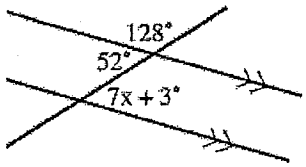

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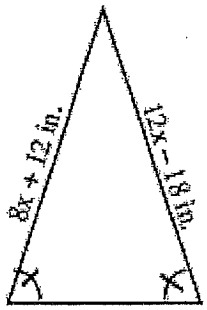

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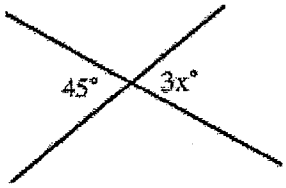


Simplify each expression. Your answer should contain no parentheses or negative exponents.

16) $\dfrac{14a^3b^2}{21a^4b}$

17) $\dfrac{4x^{18}}{(2x^{22})^0}$

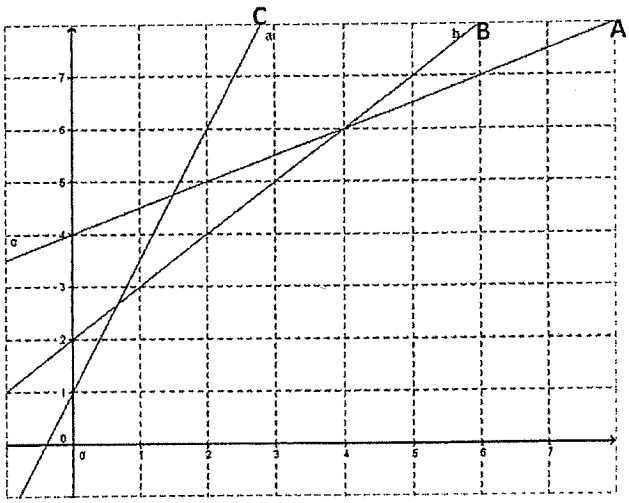
18) $(3w^{-2})^4$

Solve each equation by first rewriting the expressions in each part with the same base.

19) $9^2 = 3^{2x+1}$ 20) $4^{2x} = \left(\frac{1}{2}\right)^{x+5}$

Simplify.

21) $\sqrt[3]{125}$ 22) $\sqrt[3]{-27}$ 23) $\sqrt[4]{16}$



For problems 24 & 25, refer to the graph above.

24) Which of the lines above have the largest starting point?

25) Which of the lines above have the largest rate of growth?

26) Determine whether each of the following points lie on $y = -\frac{1}{2}x + 3$.

a) $(-4, 1)$ b) $(-2, 4)$

27) Given $2x - 3y = -9$:

a) Write the equation in slope-intercept form.

b) Write the equation of the line parallel to the given line and passing through $(-3, -5)$.

c) Write the equation of the line perpendicular to the given line and passing through $(-4, 8)$.

28) Given $(1, 3)$ and $(8, -1)$:

a) Find the slope between the 2 points.

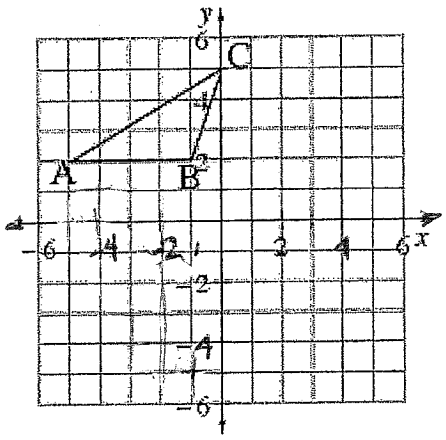
b) Find the distance between the 2 points.

c) Determine the midpoint.

29) Find the product of each of the following:

a) $(2y-1)(3y+5)$ b) $(x+2)(x+y-2)$ c) $(2y-3)^2$

30)

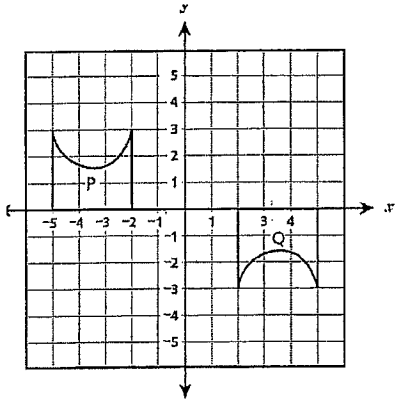


a) Rotate Figure B 90° counterclockwise about the origin to create $\Delta A'B'C'$. What are the coordinates of $\Delta A'B'C'$?

b) Find the perimeter and area of ΔABC.

c) What is the perimeter and area of $\Delta A'B'C'$?

31) What transformation(s) will move figure P onto figure Q?



32) On graph paper, graph quadrilateral *MNPQ* if *M*(–3, –8), *N*(2, –10), *P*(1, –7), *Q*(– 4, –5). *MNPQ* is a parallelogram, which means that it has two pairs of parallel sides.

a. Show that *MNPQ* is, indeed, a parallelogram.

b. Use the function $(x \rightarrow x, y \rightarrow -y)$ to reflect *MNPQ* across the *x*-axis, creating $M'N'P'Q'$. What are the coordinates of P'?

33) On graph paper, draw ΔABC if *A*(2, 4), *B*(9, 5), and *C*(4, 10).

a) Verify that *D*(3, 7) is a midpoint of $\overline{AC}$.
b) Write the equation of the line through points *D* and *B*.
c) Is $\overline{BD}$ a height of ΔABC? Use slope to show that $\overline{BD}$ is perpendicular to $\overline{AC}$.
d) What is the perimeter and area of ΔABC?

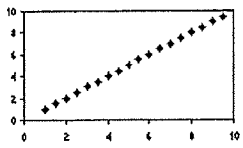
34) Solve each equation below.

a) $3(m-2)=-2(m-7)$ b) $2(x+3)+5(x-2)=-x+10$ c) $|2x-3|+2=11$

d) $14+2|3x+5|=26$ e) $U=\frac{1}{2}CV^2$, *for V* f) $\frac{y}{3}-a=b$, *for y*

g) $\frac{1}{2}x+\frac{1}{3}x-7=\frac{5}{6}x$

35) Match each graph with an appropriate correlation coefficient.



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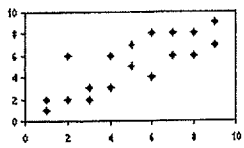

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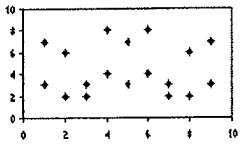

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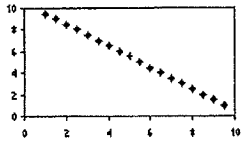

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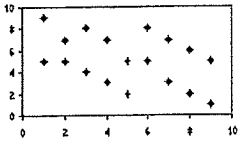


5

a) $r=-0.43$ b) $r=1$ c) $r=0.8$ d) $r=0$ e) $r=-1$

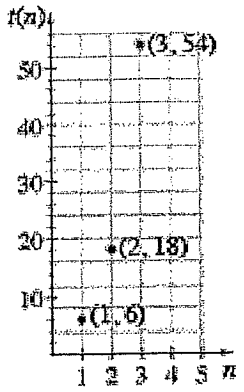
36) Write the equation for an arithmetic sequence in which $t(5)=-9$ and $t(12)=-23$.

37) The Cali Taxi Company charges a $10 flat fee plus $2.50 per mile for a ride. The Seattle Taxi Company charges a $15 flat fee plus $2.00 per ride. Write a system of equations to represent this situation. Remember to define your variable. Under what conditions would you choose The Cali Taxi Company? The Seattle Taxi Company?

38) Graph and fully describe each of the following:

a) $y=12(0.75)^x$ b) $y=2(4)^x$

39) Given the graph at right:



a) What is the multiplier for this sequence?

b) Write an explicit equation for this sequence.

40) Given each table determine whether the pattern of growth is linear, exponential, or neither. If linear or exponential, write an equation to represent the sequence.

n	0	1	2	3	4	5
$t(n)$	–14	–9	–4	1	6	11

n	0	1	2	3	4	5
$t(n)$	4	8	16	32	64	128

n	0	1	2	3	4	5
$t(n)$	30	20	12	6	2	0

41) In 2012 the average cost for a new midsized car was about $31,000. New car prices tend to go up about 2% every year.

a) What is the multiplier for this situation?

b) If this trend continues, what will the cost be in 4 years?

c) Write an equation to calculate the cost in n years. What does each of the factors in your equation represent?

42) Write equations to solve each of the following problems.

a) A brand new Chevy Malibu costs $25,500. Each year it loses 18% of its value. What will the car be worth when it is 15 years old?

b) Each year the population of Geoland increases by 9.8%. The population is currently 12,165,112. What will the population be 20 years from now?

43) Name the most efficient method of solving each system below (equal values, substitution, or elimination). Then, solve the system and describe what your solution represents graphically.

a) $\begin{aligned} -4x+6y&=-20 \\ 2x-3y&=10 \end{aligned}$

b) $\begin{aligned} y&=3x+7 \\ y&=-4x+21 \end{aligned}$

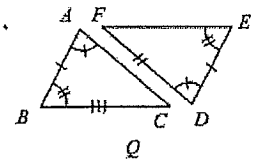
c) $\begin{aligned} 6x-2y&=10 \\ 3x-2&=y \end{aligned}$

44) Write an equation that represents the function in this table.

Week	Weight of Bacterial Culture (g)
1	756.00
2	793.80
3	833.49

45) For each of the following, make a flowchart to prove that the pairs of triangles are congruent.

a)



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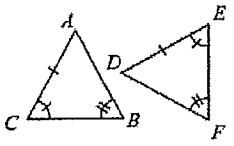

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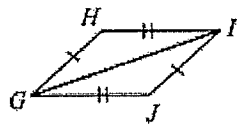

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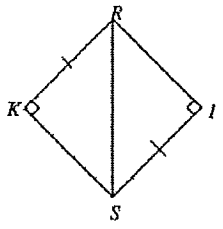

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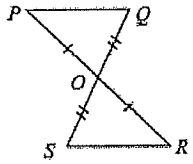

46) Solve each inequality or system of inequalities and graph the solutions.

a) $-126 \le -6(5-2n)$

b) $6(k-6)+3>81$

c) $-8|-10+5n| \le -80$

d) $9+|-3-4b|<52$

e) $3x+y \ge -5$

47) Riley buys a pair of socks for \$4 a pair and a sweater for \$35. She has \$50. Write an inequality that shows the number of pairs of socks she can buy without spending more than \$50 (assume there is a "tax free" special that day so Riley will not have to pay taxes on her purchase).