Using the Media to Learn Mathematics

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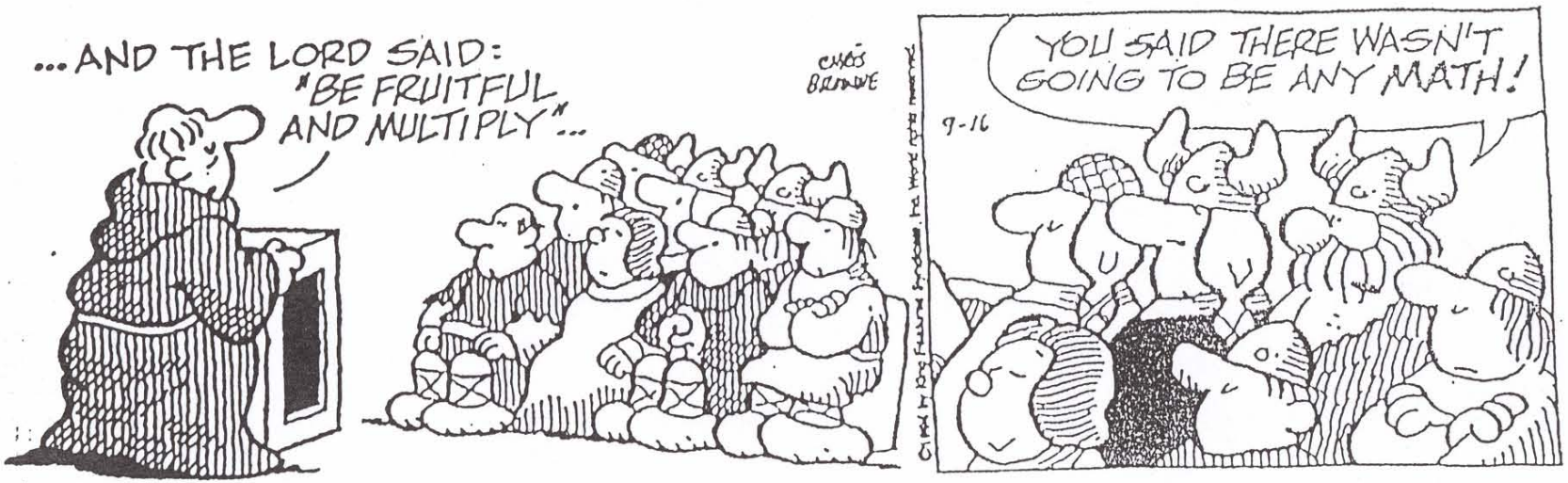
How to Use the Media to Teach Mathematics

- Authentic data to analyze can be found in newspapers daily, especially in the sports and business sections.
- Cartoons with a math focus make for interesting discussions and add humor to the discussions.
- Advertisements provide opportunities for students to develop into smart consumers through decision-making.

How to Use the Media to Teach Mathematics

- Math is conveyed (very large numbers are depicted differently in print according to locale and country; grocery ads represent decimals in various ways, etc.) in different ways.
- Innumeracies in print abound and provide subject matter for rich classroom discussions.
- Challenging problems appear in the A*sk* M*arilyn* column regularly.

What influences our views of mathematics?



Can you spot the error in the following coupon?

Dear Heloise: You recently asked for humorous incidents about cooking. Here is one of the best I have heard:

A cook complained that she couldn't double the recipe as the cookbook said because her oven would not bake at 850 degrees.

- Tom, Indianapolis

Which coupon would you use for this product?

Anne Papakonstantinou– Rice University School Mathematics Project

Is the following a good deal? Explain.

House Warming.

Get your home ready for the holiday season now and save $$$! For a limited time, take ½% OFF all In-stock FABRICS and 20% OFF on all CARPET & DRAPERIES!

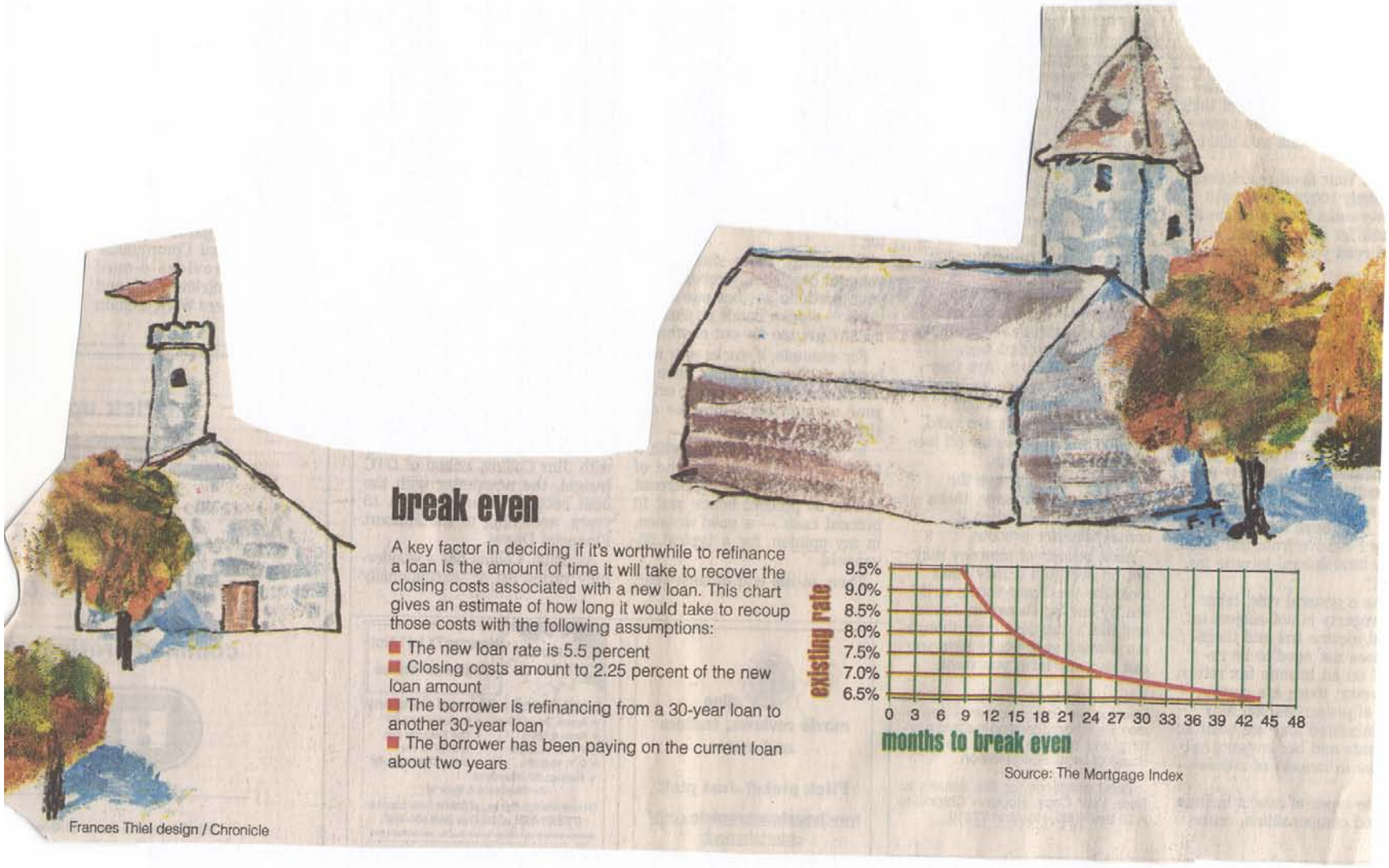
Explain your strategy for redeeming your coupons at Randalls and at Rice Epicurian Markets.

Which coupon would you use?

What A Sale!!!

This was contributed by Claudia Weitinger from Roberts Elementary. She uses this ad with her 2nd-grade students.

Explain what it means to "break even" using the data represented in the graph.



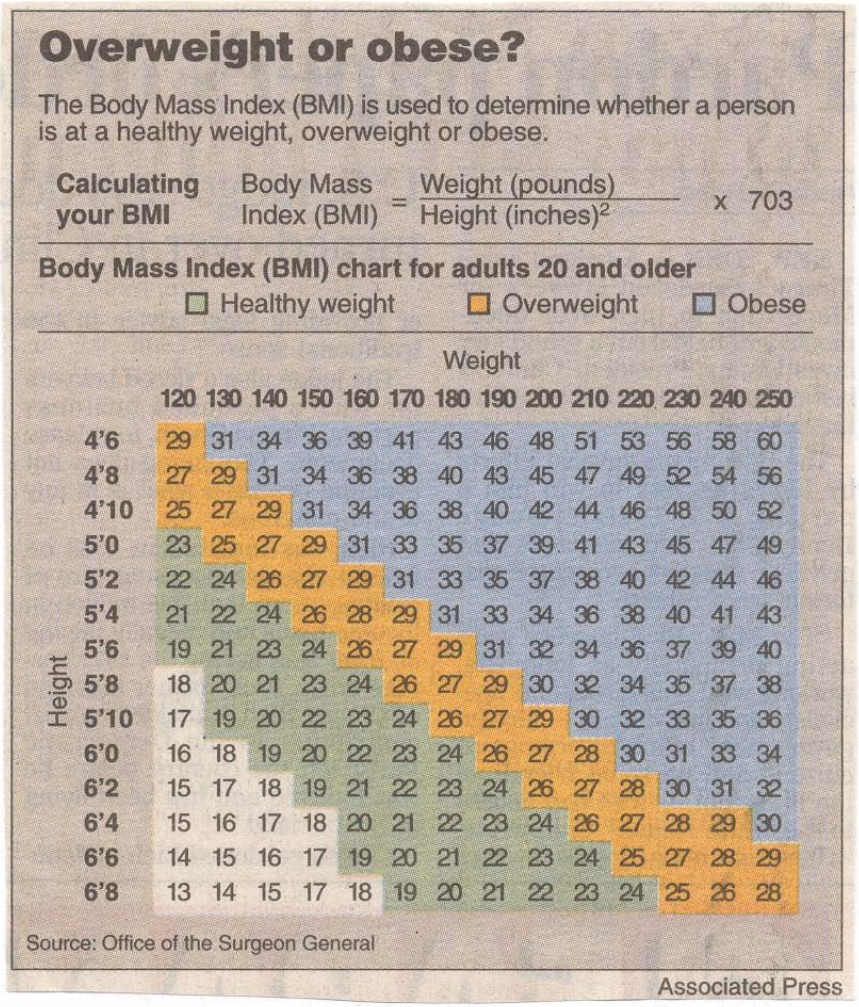
Ask Marilyn

The answer to a problem is 45678. You arrive at this by subtracting one number from another. The two numbers contain the digits 0, 1, 2, 3, 4, 5, 6, 7, 8, and 9. You must use each of these digits once, but only once. What two numbers do you subtract to arrive at this answer?

-Janis Bennion, Salt Lake City, Utah

This is a nice one for the math classes.

What is *YOUR* Body Mass Index?



Overweight or obese?

The Body Mass Index (BMI) is used to determine whether a person is at a healthy weight, overweight or obese.

Calculating your BMI

$$\text{Body Mass Index (BMI)} = \frac{\text{Weight (pounds)}}{\text{Height (inches)}^2} \times 703$$

Body Mass Index (BMI) chart for adults 20 and older

Healthy weight | Overweight | Obese

Height \ Weight	120	130	140	150	160	170	180	190	200	210	220	230	240	250
4'6	29	31	34	36	39	41	43	46	48	51	53	56	58	60
4'8	27	29	31	34	36	38	40	43	45	47	49	52	54	56
4'10	25	27	29	31	34	36	38	40	42	44	46	48	50	52
5'0	23	25	27	29	31	33	35	37	39	41	43	45	47	49
5'2	22	24	26	27	29	31	33	35	37	38	40	42	44	46
5'4	21	22	24	26	28	29	31	33	34	36	38	40	41	43
5'6	19	21	23	24	26	27	29	31	32	34	36	37	39	40
5'8	18	20	21	23	24	26	27	29	30	32	34	35	37	38
5'10	17	19	20	22	23	24	26	27	29	30	32	33	35	36
6'0	16	18	19	20	22	23	24	26	27	28	30	31	33	34
6'2	15	17	18	19	21	22	23	24	26	27	28	30	31	32
6'4	15	16	17	18	20	21	22	23	24	26	27	28	29	30
6'6	14	15	16	17	19	20	21	22	23	24	25	27	28	29
6'8	13	14	15	17	18	19	20	21	22	23	24	25	26	28

Source: Office of the Surgeon General

Associated Press

Explain the mathematics in the ad.

Friday, Feb. 22, 2002 Houston Chronicle ★★

Future > Status Quo

invent^2

Anne Papakonstantinou– Rice University School Mathematics Project

Dear Ann Landers: I am a 47-year-old single mother. I own my home and car and consider myself intelligent and capable.

Here's the problem: I am in school to become a paralegal and must take algebra in order to get my degree. I will never use algebra in real life, nor is it a necessary component of being a paralegal. However, algebra is required in order for me to graduate.

I am terrible in math, Ann. I already have taken algebra once and failed. I am certain I will continue to fail, no matter how many times I take the class. Can you help me? I don't know what to do anymore.
--The Dummy in San Antonio

Dear San Antonio: I too, wonder why higher-level math classes are required for people who will never use them. Talk to the algebra teacher and ask for his or her assistance. Also, please consider hiring a tutor. The results will be worth it.

This letter and response appeared in the Houston Chronicle right before Ann Landers' death.

Here's the counterpart for geometry to the question "When will I use algebra?" that Ann Landers received. This comes from Ask Marilyn.

We're writing because our geometry teacher told us that if we get published (hint, hint), he will give us extra credit. Our question is: When in our life are we going to use proofs?

-Jen and Anne

Kaysville, Utah

You will use them every day, I hope, without knowing it. Geometry is beautifully logical, and it teaches you how to think and prove things that are so, step by step. Proofs are excellent lessons in reasoning. Without logic and reasoning, you are dependent on jumping to conclusions or –worse- having empty opinions.

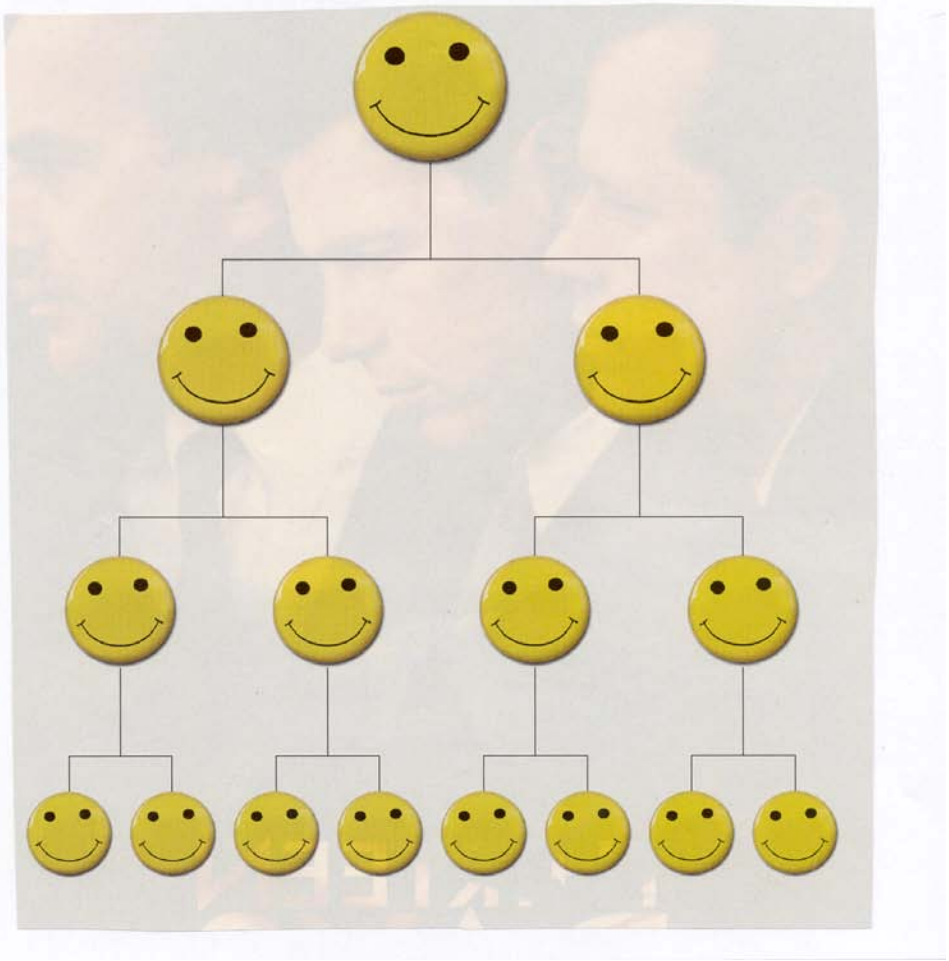
Here is a great article for discussion from Ask Marilyn.

Do you have any ideas about why more people don't understand math any better than they do? The problem seems to begin in school and the struggle- for too many – lasts a lifetime.

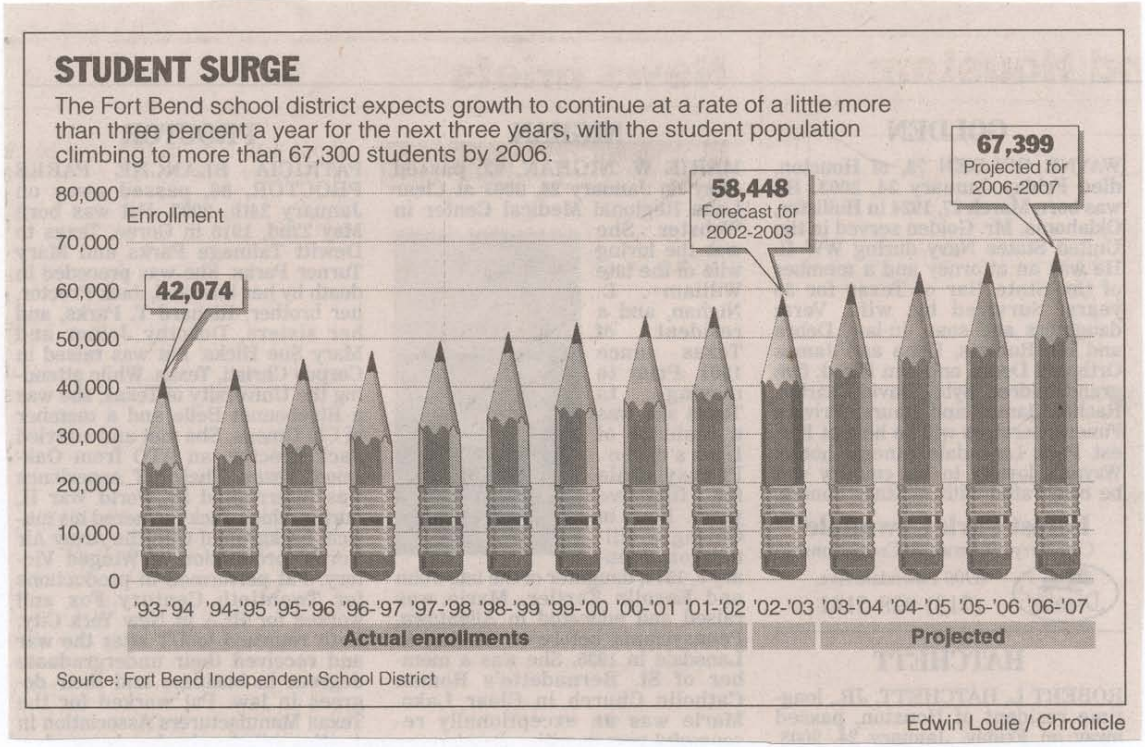
-Jean Acerra,
Newton, Mass.

I believe that much of the problem lies in the lack of logic and reasoning skills. Math is just logic with numbers and symbols attached, and success with it requires the ability to reason effectively. But children usually are taught ***what*** to think, not ***how*** to think. That's why so many adults live in a state of perpetual misunderstanding about the world.

Extend the ***Smiley Face*** pattern by drawing the next two rows of smiley faces. Describe the functional relationship depicted in the picture. Use your functional relationship to find the number of smiley faces on the twentieth row.



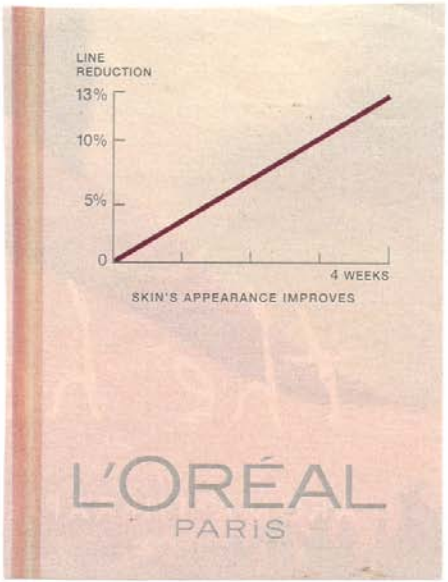
Write a mathematical function to describe the data graphed. Does the sentence at the top accurately describe the relationship depicted in the graph? Why or why not?



Explain in words and with an equation the functional relationship that the graph describes.

What is a reasonable domain for this function?

What is a reasonable range for this function?



In the following ad, describe the functional relationship graphically and in words.

- What is the domain of the function?

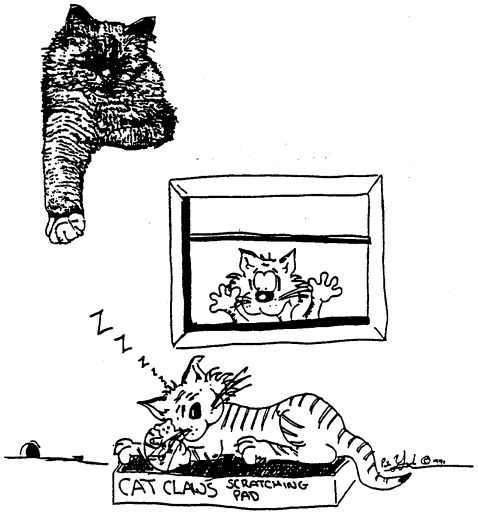
- What is the range of the function?

GOBBLE UP TO THREE TURKEYBUCKS PER VISIT!
SPEND $30 = GET 1 TURKEYBUCK
SPEND $60 = GET 2 TURKEYBUCK
SPEND $90 = GET 3 TURKEYBUCK
TURKEYBUCK + COUPON = SAVINGS!
CHECK YOUR WEEKLY AD FOR TURKEYBUCKS COUPONS!

Describe one of the functional relationships in the *Cat Claws Scratching Pad* ad graphically and in words.

What is the domain of your function?

What is the range of your function?



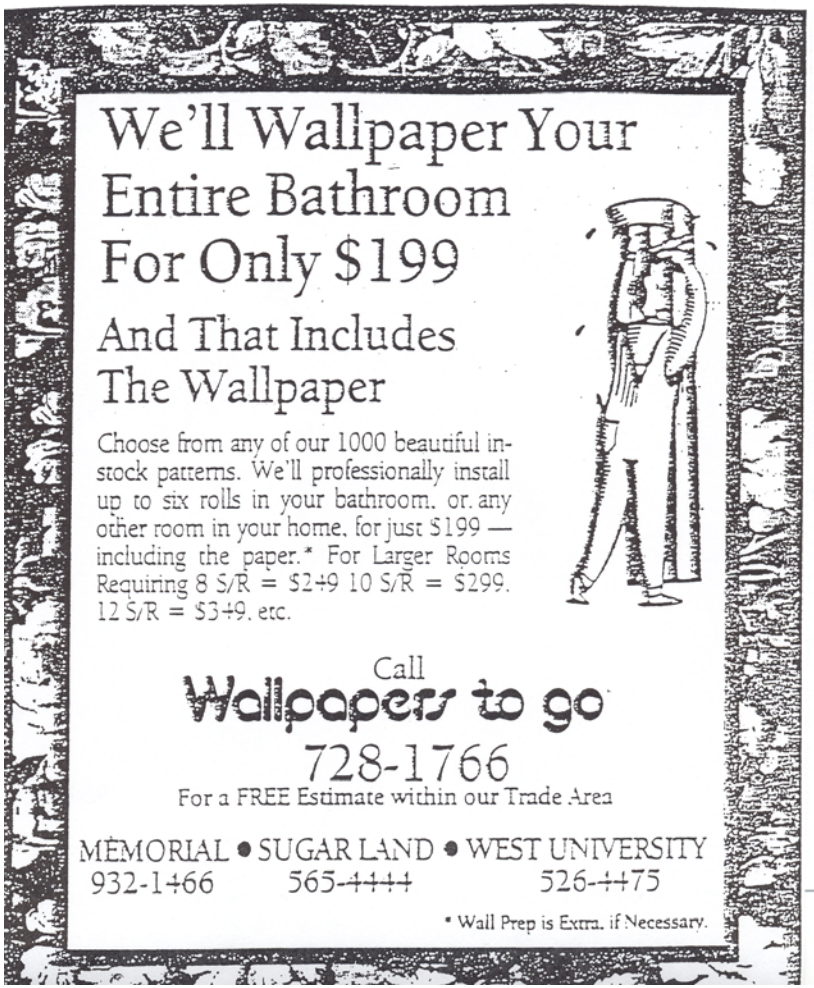
The Purrfect Gift for Your Cat
--and for Anyone with Cats

Cat Claws Scratching Pad
1 pad $7.95,
2 to 5 pads $6.75 ea.,
6 to 11 pads $6.00 ea.,
12 or more
$5.00 ea.

In the following ad, describe the functional relationship graphically and in words.

What is the domain of the function?

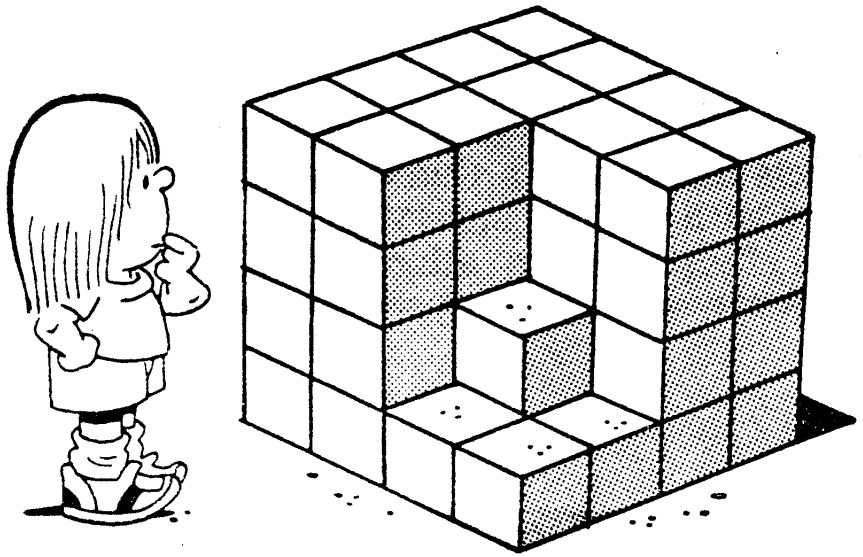
What is the range of the function?



KidSpot™

BLOCKED OUT

THIS PUZZLE PILE WILL BLOCK YOU OUT. HOW MANY BLOCKS ARE MISSING FROM THE STACK? AFTER YOU'VE COUNTED THEM, TURN THE PICTURE UPSIDE DOWN AND STARE AT THE STACK. THE STACK WILL SEEM TO CHANGE POSITION, AND YOU WILL SEE THE MISSING BLOCKS.



Dick Rogers

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ANS: ELEVEN BLOCKS ARE MISSING FROM THE STACK.

From an *Ask Marilyn* Column

You once said researchers had determined that it would take seven ordinary shuffles to thoroughly mix a deck of cards. I regularly play a solitaire game that requires two decks. How many times should I shuffle them to get the same result?
-Diana Lewis, Clayton, Mo.

Nine times. Six decks require 12 shuffles. Casino owners won't be pleased to hear this, but fewer shuffles just aren't enough. More shuffles don't help much.

Can you describe the functional relationship in this problem?

A*sk* M*arilyn*

In a certain multiple-choice test, one question was illegible, but the following choice of answers was clearly printed. Which must be the right answer?

1) All of the below
2) None of the below
3) All of the above
4) One of the above
5) None of the above
6) None of the above

-Mark Johnson,
Spokane, Wash.

Construct an argument to support why 5 must be the correct answer.

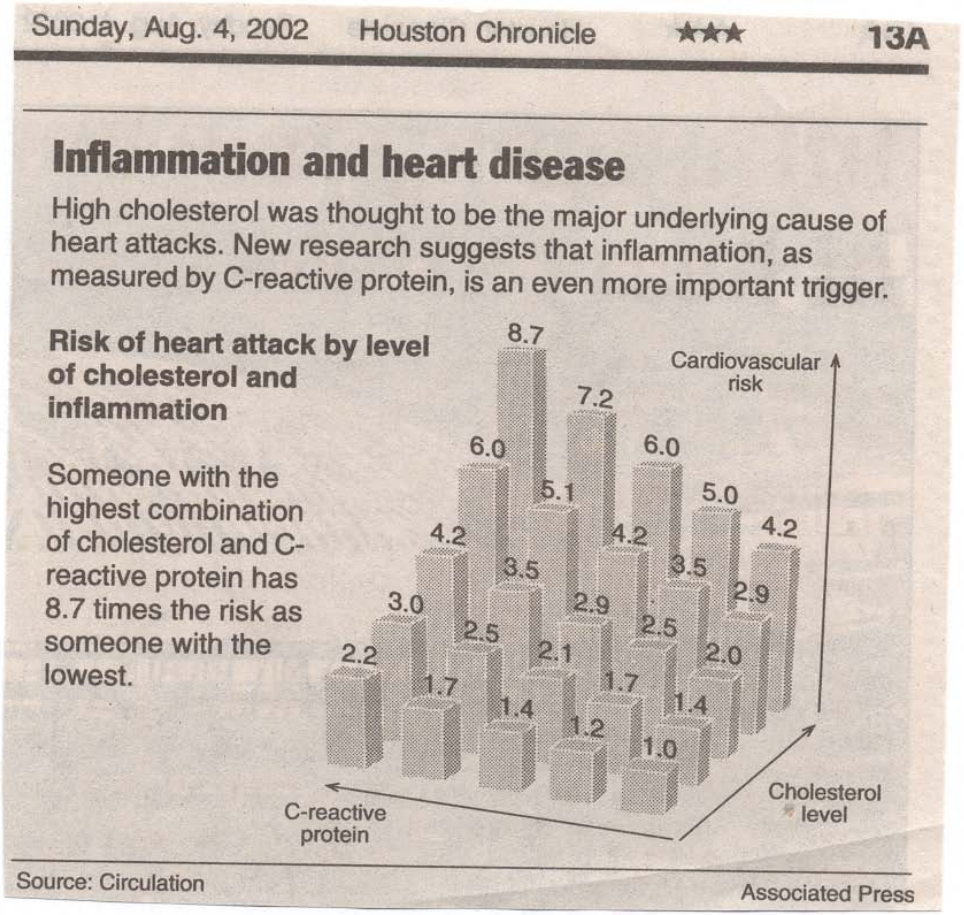
So, what do we believe?

A*sk* M*arilyn*

Say that a bottle and cork cost $1.10 together. Also say that the bottle costs $1 more than the cork. What does the cork cost?

- D. Blume, Annandale, Va.

Write a letter to your aunt or uncle explaining what this graph is reporting.



Sunday, Aug. 4, 2002 Houston Chronicle ★★★ 13A

Inflammation and heart disease

High cholesterol was thought to be the major underlying cause of heart attacks. New research suggests that inflammation, as measured by C-reactive protein, is an even more important trigger.

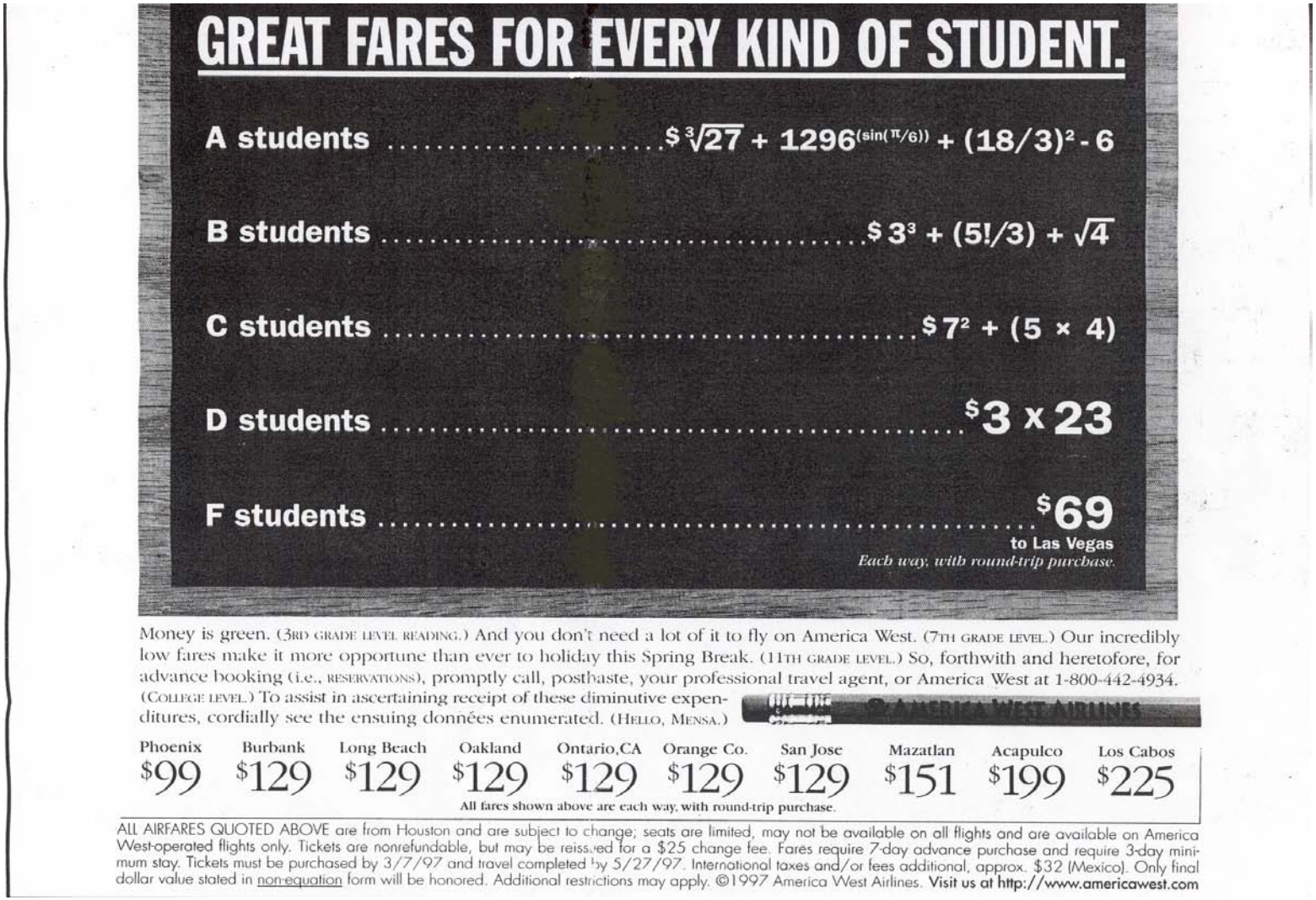
Risk of heart attack by level of cholesterol and inflammation

Someone with the highest combination of cholesterol and C-reactive protein has 8.7 times the risk as someone with the lowest.

Source: Circulation

Associated Press

Write expressions for great fares for A, B, C, D and F students for trips to Phoenix, to San Jose and to Los Cabos.



GREAT FARES FOR EVERY KIND OF STUDENT.

A students ..... $\$\sqrt[3]{27} + 1296^{(\sin(\pi/6))} + (18/3)^2 - 6$

B students ..... $\$3^3 + (5!/3) + \sqrt{4}$

C students ..... $\$7^2 + (5 \times 4)$

D students ..... $\$3 \times 23$

F students $69

to Las Vegas

Each way, with round-trip purchase.

Money is green. (3RD GRADE LEVEL READING.) And you don't need a lot of it to fly on America West. (7TH GRADE LEVEL.) Our incredibly low fares make it more opportune than ever to holiday this Spring Break. (11TH GRADE LEVEL.) So, forthwith and heretofore, for advance booking (i.e., RESERVATIONS), promptly call, posthaste, your professional travel agent, or America West at 1-800-442-4934. (COLLEGE LEVEL.) To assist in ascertaining receipt of these diminutive expenditures, cordially see the ensuing données enumerated. (HELLO, MENSA.)

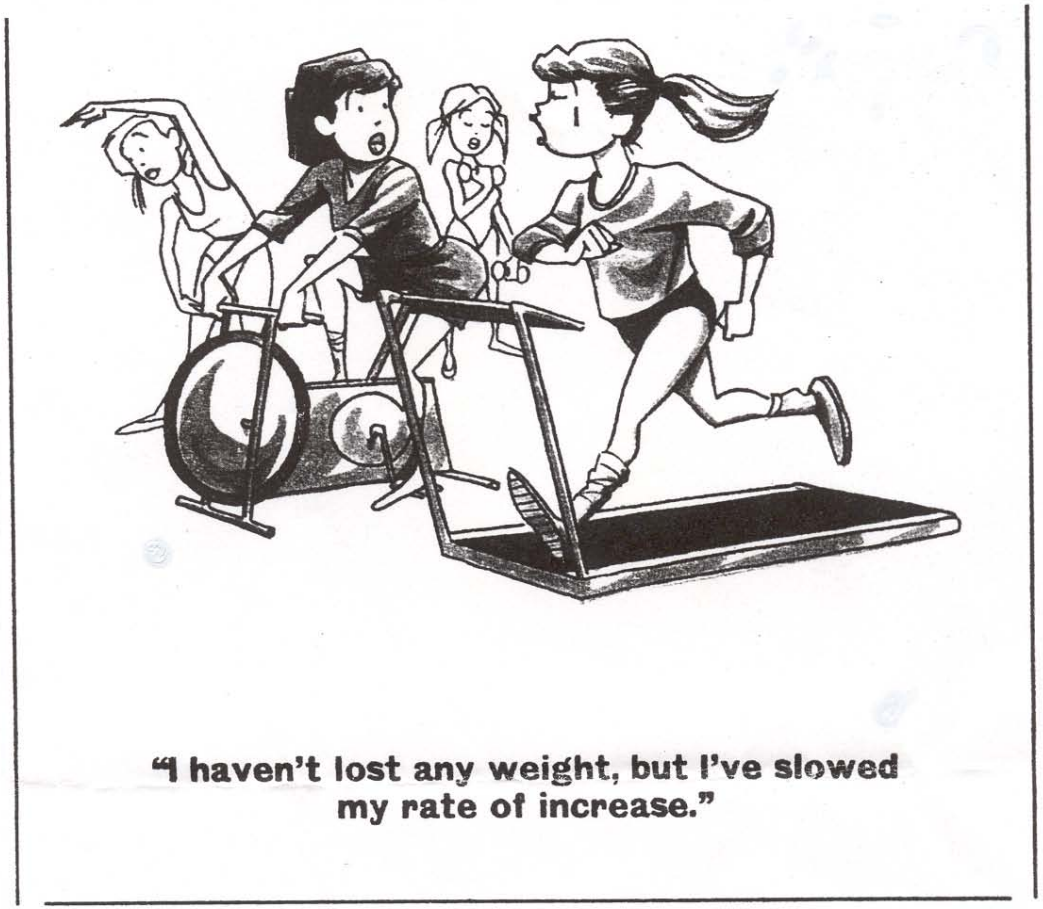
AMERICA WEST AIRLINES

Phoenix	Burbank	Long Beach	Oakland	Ontario,CA	Orange Co.	San Jose	Mazatlan	Acapulco	Los Cabos
$99	$129	$129	$129	$129	$129	$129	$151	$199	$225

All fares shown above are each way, with round-trip purchase.

ALL AIRFARES QUOTED ABOVE are from Houston and are subject to change; seats are limited, may not be available on all flights and are available on America West-operated flights only. Tickets are nonrefundable, but may be reissued for a $25 change fee. Fares require 7-day advance purchase and require 3-day minimum stay. Tickets must be purchased by 3/7/97 and travel completed by 5/27/97. International taxes and/or fees additional, approx. $32 (Mexico). Only final dollar value stated in non-equation form will be honored. Additional restrictions may apply. ©1997 America West Airlines. Visit us at http://www.americawest.com

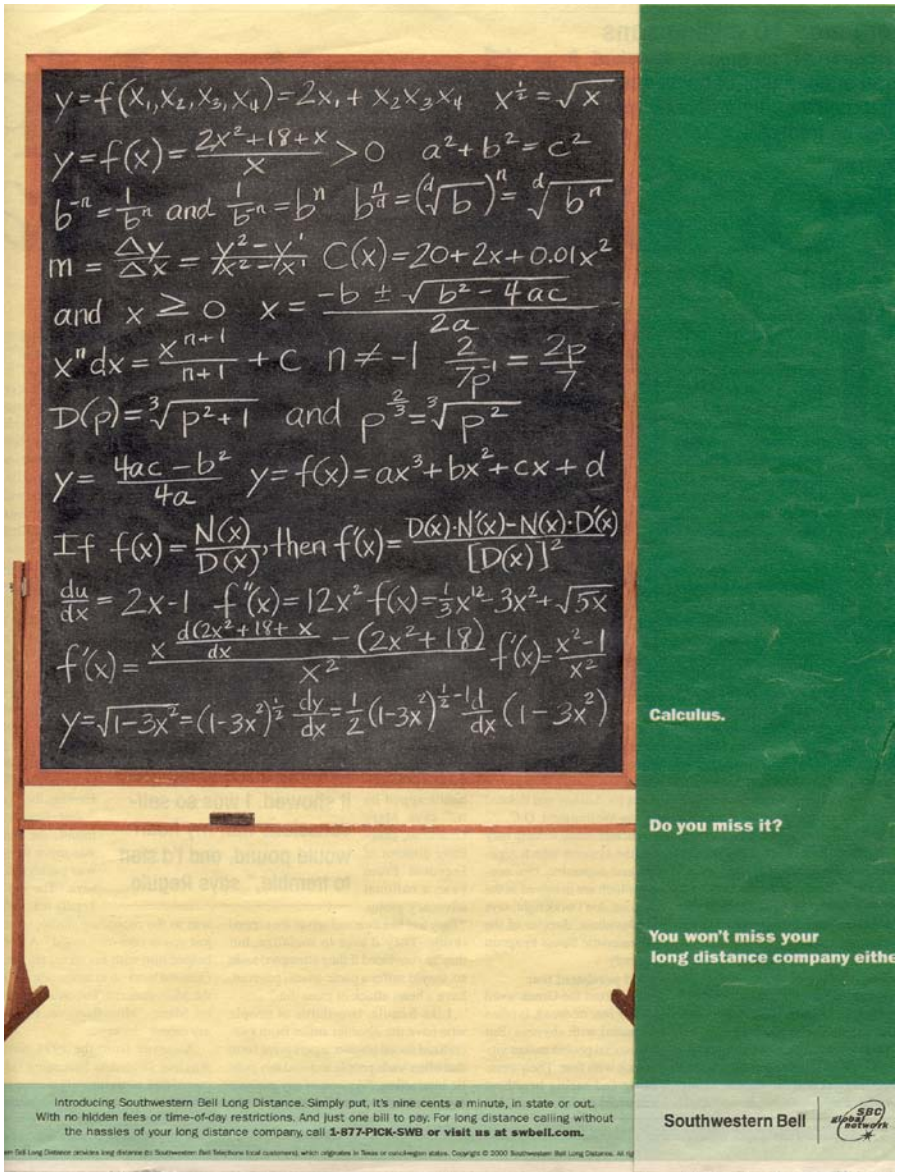
Draw a distance-time graph to explain mathematically what she is saying. Label your axes.



"I haven't lost any weight, but I've slowed my rate of increase."

PARADE MAGAZINE · JULY 9, 2000 · PAGE 13

Is this *all* calculus? Can you find the errors?

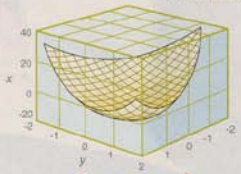


What is this ad saying?

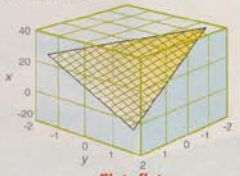
More than you need to know.

Concave Triangular Surfaces and You.

Maximum curvature = Serious dippability



Concave: good



Flat: flat

Figure 7 shows the graph of the function f in Example 6 and the graphs of its first- and second-order partial derivatives for $-2 < x < 2$, $-2 < y < 2$.

Torengos Theorem
Suppose f is defined on a disk D that contains f

$$f_{xy}(a,b)=f_{yx}(a,b)$$

EXAMPLE 2 If $f(x,y)=4-x^2-2y^2$, find $f_x(1,1)$ and $f_y(1,1)$ and interpret these numbers as slopes.

$f_x(x,y)=-2x$ $\quad$ $f_y(x,y)=-4y$

$f_x(1,1)=-2$ $\quad$ $f_y(1,1)=-4$

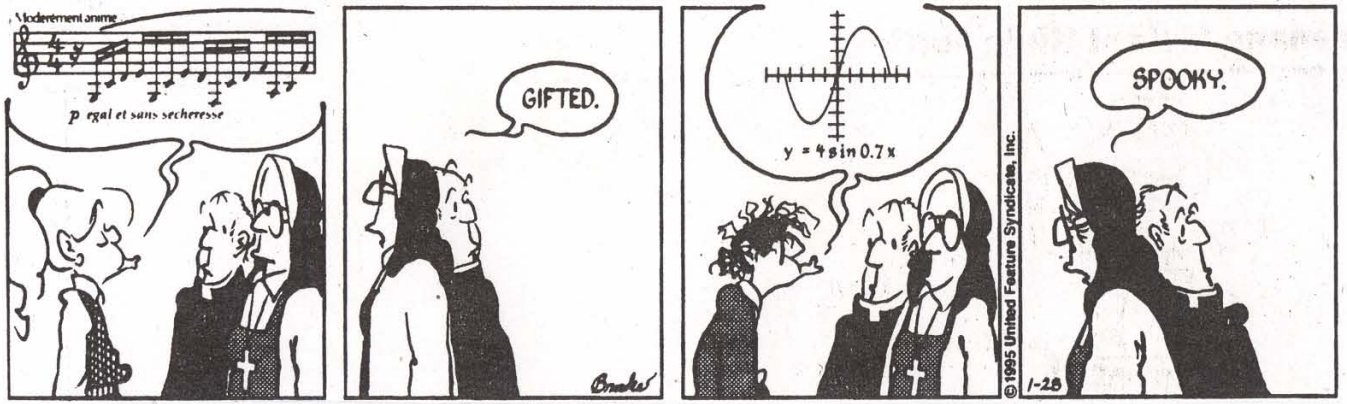
The graph of f is the paraboloid $z=4-x^2-2y^2$ and the vertical plane $y=1$ intersects it in the parabola $z=2-x^2$.

All you need to know.

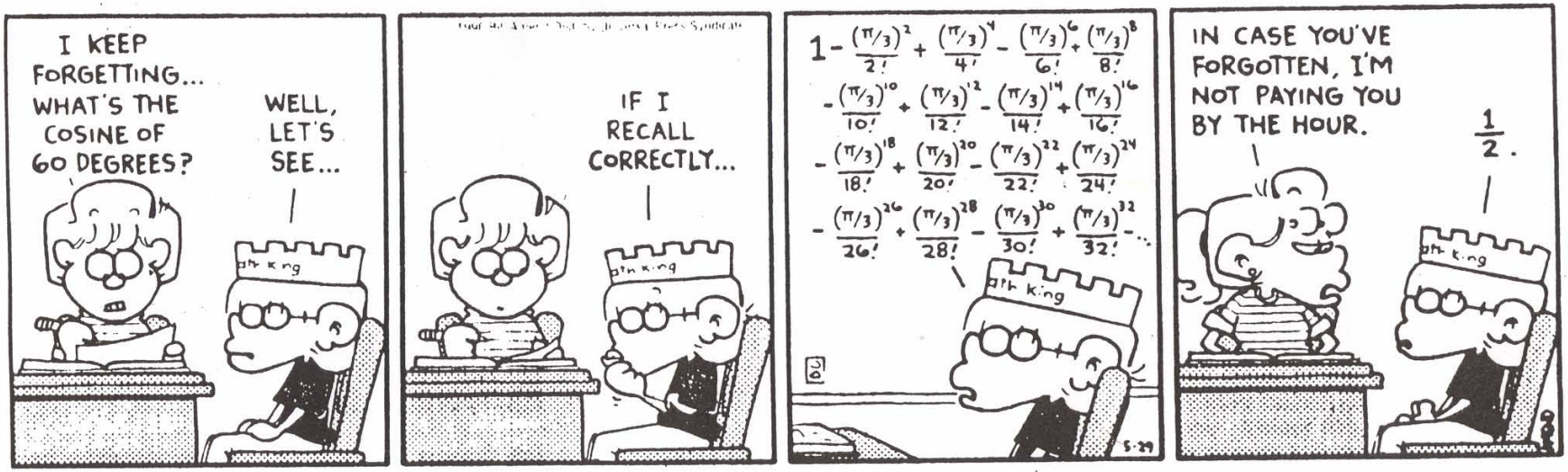
Curved for Serious Dipping

Advanced humor?

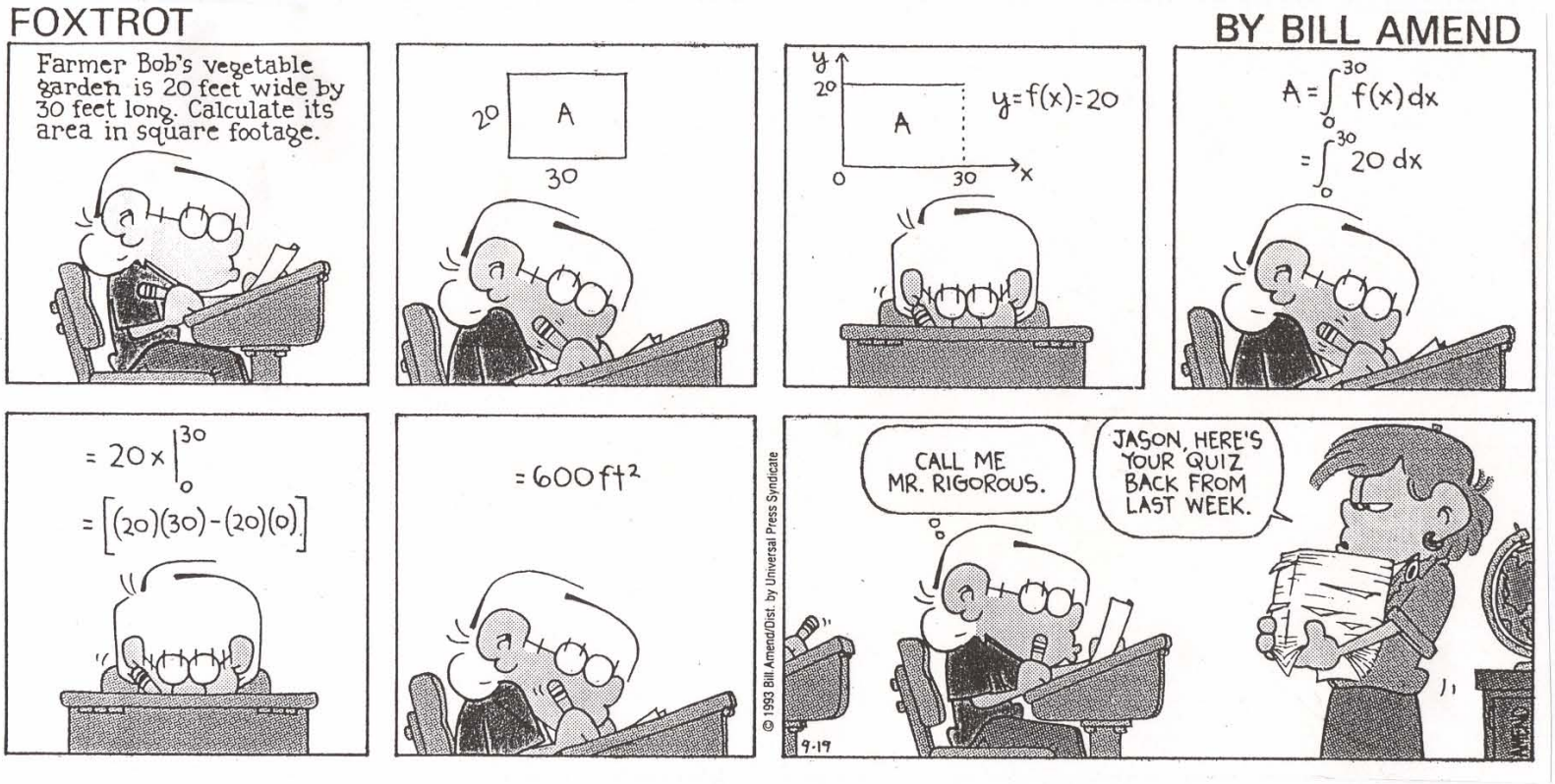
9 Chickweed Lane



Fox Trot



Advanced humor?



ALL MAJOR CREDIT CARDS
No Cover charge till 7pm !!
Babe's
HAPPY HOUR
11am - 8pm
TOPLESS
AMATEUR
Dance Contest
Tuesday Nights
FREE LUNCH
served daily
$1.75
Draft
BEER
All day
All night!!
3) 781-3675
croft at Westpark
ALL MAJOR CREDIT CARDS
No Cover charge till 7pm !!
Babe's
HAPPY HOUR
11am - 8pm
TOPLESS
AMATEUR
Dance Contest
Tuesday Nights
FREE LUNCH
served daily
11am - 2pm
Free Seafood
Buffet
Fridays 5pm - 8pm
HELD OVER
.96¢
Draft
BEER
OFFER EXPIRES 5/31/96
11am till 8pm
EVERYDAY!!
(713) 781-3675
5614 Hillcroft at Westpark

Some other ideas on what you can have your students do:

- Get an ad such as one from Target, Randalls, or Penney's. Have students find numbers greater than or less than a given number in the ad. Or give students a fixed amount of money to spend; let them find several combinations of items that they can purchase with that amount.

- Have students research how Stock Market reporting has changed (fractions to decimals).

- Have students analyze the game statistics after a football game, baseball game, or basketball game.

Some other ideas on what you can have your students do:

- Have students answer the Marilyn Vos Savant math questions in a letter to Marilyn. Remember the interest created by the Monte Hall *Let's Make a Deal* question that appeared in her column years ago.

- Have students create a book of innumeracies and then have students follow up with the businesses that made the math mistakes.

- Have students select a cartoon to enlarge to twice its size.

Some other ideas on what you can have your students do:

- Have students find examples of functions in the newspaper. Have them represent each functional relationship depicted as a set of ordered pairs, a graph, and an equation. Justify why each is a function.

- Have students create a book on how very large and very small numbers are depicted around the United States and around the world using printed materials.