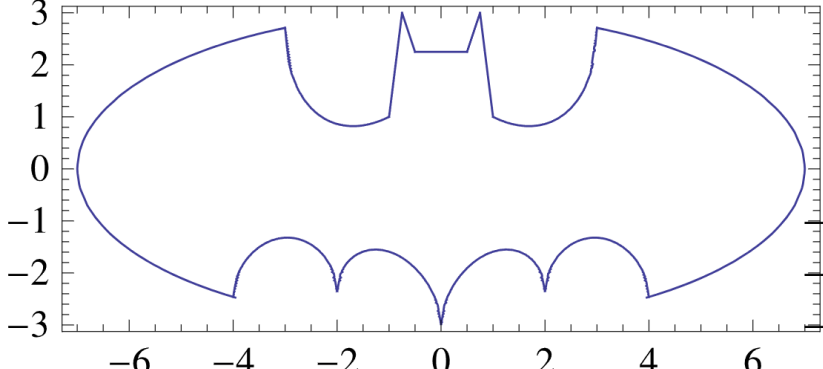
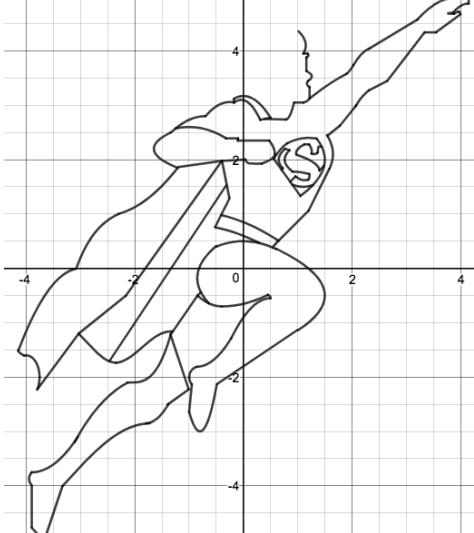


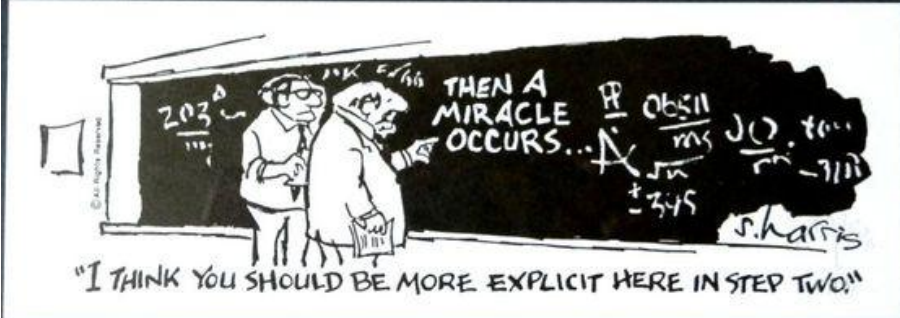
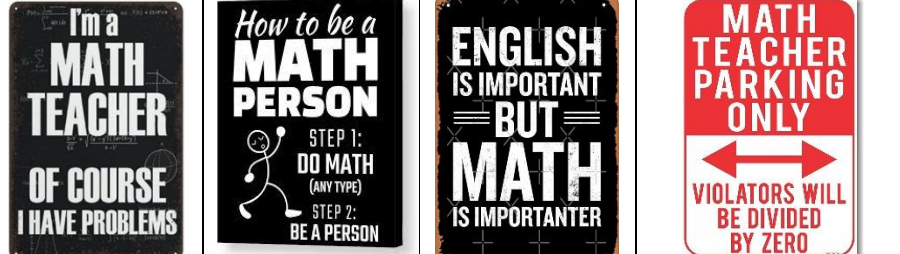
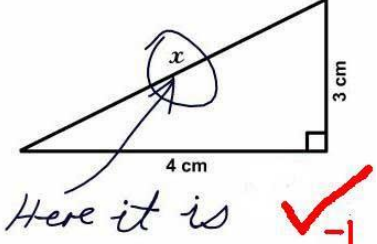
Harold's Math is Fun – Part 1
Cheat Sheet
 23 March 2026

Cool Graph Equations









Description	Equation	Graph
Heart – Rectangular	$f(x) = x^{2/3} + 0.9 \sin(kx) \sqrt{3 - x^2}$ $k = 81.5$	
Heart – Polar	$r = 3.6 - \frac{\cos(2\theta) + 3 \sin(\theta)}{0.8 + \cos(\theta) } + 1.5 \cos(2\theta)$	
Heart – Parametric	$x(t) = 16(\sin t)^3$ $y(t) = 13 \cos(t) - 5 \cos(2t) - 2 \cos(3t) - \cos(4t)$ $0 \leq t \leq 2\pi$	
Persian Rug	$\sin(\cos(\tan(xy))) = \sin(\cos(\tan(x))) + \sin(\cos(\tan(y)))$	

<p>Batman Equation</p>		
	<p>Upper Part: $f(x) = (h - l)H(x + 1) + (r - h)H(x - 1) + (l - w)H(x + 3) + (w - r)H(x - 3) + w$</p>	
	<p>Lower Part : $g(x) = \frac{1}{2} \left[\frac{ x }{2} + \sqrt{1 - (x - 2 - 1)^2} - \frac{1}{122} (3\sqrt{33} - 7)x^2 + w - 3 \right] \cdot [sgn(x + 4) - sgn(x - 4)] - w$</p>	
<p>Where $H(x)$ is the Heaviside step function</p> $H(x) = \begin{cases} 0 & x < 0 \\ \frac{1}{2} & x = 0 \\ 1 & x > 0 \end{cases}$ <p>and</p> $w = 3 \sqrt{1 - \left(\frac{x}{7}\right)^2}$ $l = \frac{1}{2}(x + 3) - \frac{3}{7}\sqrt{10}\sqrt{4 - (x + 1)^2} + \frac{6}{7}\sqrt{10}$ $r = \frac{1}{2}(3 - x) - \frac{3}{7}\sqrt{10}\sqrt{4 - (x + 1)^2} + \frac{6}{7}\sqrt{10}$ $h = \frac{1}{2} \left[f \left(\left x + \frac{1}{2} \right + \left x - \frac{1}{2} \right + 6 \right) - 11 \left(x + \frac{3}{4} \right) + \left x - \frac{3}{4} \right \right]$		
<p>Superman</p>	<p>Desmos</p>	

Fun Math Quotes


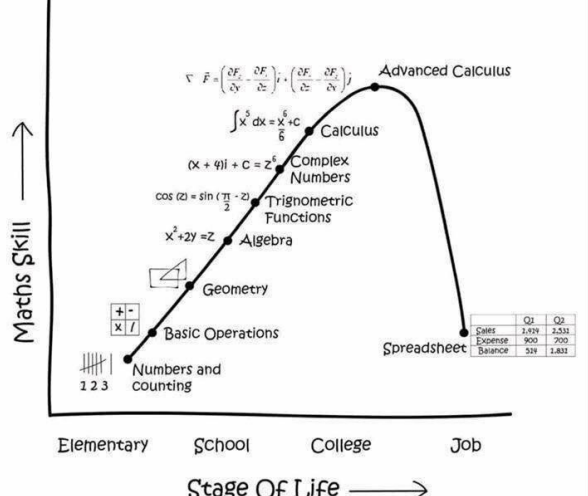
Description	Equation	Note
Then a Miracle Occurs		
Math Teacher Signs		
Find x	$a^2 + b^2 = c^2$	<p>3. Find x.</p> 
3 Types of People	<p>"There are three types of people: those who can count and those who cannot." - Gene Wolfe</p>	
Lottery Tax	<p>"Lottery: A tax on people who are bad at math."</p>	
Carnivorous Integers	<p>Q: Why was 6 afraid of 7? A: Because 7 ate 9, since you are supposed to eat 3 squared meals a day.</p>	
Old MacDonald	<p>"Old Macdonald had a form, $e_i \wedge e_i = 0$."</p>	
Pierre de Fermat	<p>Pierre de Fermat walks into a bar. "I have devised a most humorous punchline to this joke, but this margin is too narrow to contain it."</p>	
Hiitchhiker	<p>A kindergarten teacher asked students to introduce their parents.</p> <ul style="list-style-type: none"> "My mom is a doctor. She saves lives!" "Wonderful!" "My dad drives for Uber. He takes people where they need to go!" "That's nice." "My dad kills hitchhikers and sells their valuables on eBay!" "Goodness gracious!" <ul style="list-style-type: none"> "Actually, I'm a mathematician, but how can you explain that to kids?" 	
Breaking Bad Parody	<p>"I took care of it. I divided by zero."</p>	<p>Studio C two math teachers' parody of the TV series "Breaking Bad", where they were dealing in Math, not Meth.</p>

Beautiful Math

Description	Equation	Note
<p>Euler's Identity</p>	<div style="text-align: center;"> <h3>What makes an equation beautiful?</h3> <p>Euler's identity is considered to be one of the most beautiful equations</p> $e^{i\pi} + 1 = 0$ <p>Features five fundamental mathematical constants</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>≈ 2.71828 The base of natural logarithms</p> </div> <div style="text-align: center;">  <p>$i^2 = -1$ The imaginary unit of the complex numbers</p> </div> <div style="text-align: center;">  <p>≈ 3.14159 The ratio of a circle's circumference to its diameter</p> </div> </div> <div style="display: flex; justify-content: space-around; margin-top: 20px;"> <div style="text-align: center;">  <p>The multiplicative identity</p> </div> <div style="text-align: center;">  <p>The additive identity</p> </div> </div> <p>Three basic arithmetic operations</p> <div style="display: flex; justify-content: space-around; margin-top: 20px;"> <div style="text-align: center;">  <p>Addition</p> </div> <div style="text-align: center;">  <p>Multiplication</p> </div> <div style="text-align: center;">  <p>Exponentiation</p> </div> </div> </div>	
<p>Gamma Function: Factorial of a Fraction</p>	$\left(\frac{1}{2}\right)! = \frac{\sqrt{\pi}}{2}$	

Deceptive Algebra Proofs







Description	Equation	Note
$2 = 1$	$a = b$ $a^2 = a \cdot b$ $a^2 - b^2 = a \cdot b - b^2$ $(a + b)(a - b) = b(a - b)$ $a + b = b$ $b + b = b$ $2b = b$ $\mathbf{2 = 1}$	Can you find the illegal operation?
$2 + 2 = 5$	$0 = 0$ $20x - 20x = 25x - 25x$ $4x \cdot 5 - 4x \cdot 5 = 5x \cdot 5 - 5x \cdot 5$ $4x(5 - 5) = 5x(5 - 5)$ $4x = 5x$ $4 = 5$ $\mathbf{2 + 2 = 5}$	That darn zero again
$2 = 0$	$2 = 1 + 1$ $2 = 1 + \sqrt{1}$ $2 = 1 + \sqrt{(-1)(-1)}$ $2 = 1 + \sqrt{(-1)} \cdot \sqrt{(-1)}$ $2 = 1 + i \cdot i$ $2 = 1 + i^2$ $2 = 1 - 1$ $\mathbf{2 = 0}$	Complex numbers
$1 = -1$	$1 = 1$ $1 = \sqrt{1}$ $1 = \sqrt{(-1)^2}$ $1 = \sqrt{-1} \sqrt{-1}$ $1 = i^2$ $\mathbf{1 = -1}$	Imaginary numbers
$\$1 = 1\text{¢}$	$\$1 = 100 \text{ cents}$ $\$1 = (10 \text{ cents})^2$ $\$1 = (\$0.1)^2$ $\$1 = \0.01 $\mathbf{\$1 = 1\text{¢}}$	Proof that \$1 = 1 cent
$\pi = 3$	$x = (\pi + 3)/2$ $2x = \pi + 3$ $2x(\pi - 3) = (\pi + 3)(\pi - 3)$ $2\pi x - 6x = \pi^2 - 9$ $9 - 6x = \pi^2 - 2\pi x$ $9 - 6x + x^2 = \pi^2 - 2\pi x + x^2$ $(3 - x)^2 = (\pi - x)^2$ $3 - x = \pi - x$ $\mathbf{\pi = 3}$	<p>"And he made a molten sea, ten cubits from the one brim to the other: <i>it was</i> round all about, and his height <i>was</i> five cubits: and a line of thirty cubits did compass it round about."</p> <p>- 1 Kings 7:23</p>

<p>Girls are Evil</p>	<p>Given:</p> <p>Girls = Time x Money Time = Money Money = $\sqrt{\text{Evil}}$</p> <p>Proof:</p> <p>Girls = (Money)² Girls = ($\sqrt{\text{Evil}}$)² Girls = Evil</p>	<p>Proof that girls are evil</p>
<p>Dilbert's Salary Theorem</p>	<p>Given:</p> <p>Knowledge is Power Time is Money Power = Work/Time</p> <p>Proof:</p> <p>Knowledge = Power Knowledge = Work/Time Knowledge = Work/Money Money = Work/Knowledge</p> $\text{Money} = \lim_{\text{Knowledge} \rightarrow 0} \frac{\text{Work}}{\text{Knowledge}} \rightarrow \infty$ <p>Conclusion:</p> <p>All else being equal, the less you know, the more money you make.</p>	<p>Proof relating to Knowledge, Power, and Money</p> <p>If Work is held constant as a positive number, Money approaches infinity (∞) as Knowledge approaches zero (0).</p>
<p>Halloween = Christmas</p>	<p>OCT 31 = DEC 25 Halloween = Christmas</p>	<p>Think of octal and decimal.</p>
<p>Merry Christmas</p>	$y = \frac{\ln\left(\frac{x}{m} - sa\right)}{r^2}$ $r^2 y = \ln\left(\frac{x}{m} - sa\right)$ $e^{r^2 y} = \frac{x}{m} - sa$ $me^{r^2 y} = x - sam$ $me^{rry} = x - mas$	
<p>Spreadsheets</p>		

Deceptive Geometry Proofs

Description	Picture	
<p>Lost Squares</p>		
<p> $S_1 = \frac{10 \times 12}{2} = 60$ $S_2 = 60 - 2 = 58$ $S_3 = 9 \times 7 - 4 = 59$ </p>		
<p>Free Chocolate</p>		

Math Puzzles

Description	Equation		Note				
<p>How many numbers can you see?</p>							
<p>Where did the other dollar go?</p>	<p>Three guys in a hotel call room service and order two large pizzas. The delivery boy brings them up with a bill for exactly \$30.00. Each guy gives him a \$10.00 bill, and he leaves.</p> <p>When he hands the \$30.00 to the cashier, he is told that a mistake has been made. The bill was only \$25.00, not \$30.00. The cashier gives the delivery boy five \$1.00 bills and tells him to take them back to the 3 guys who ordered the pizza.</p> <p>On the way back to their room, the delivery boy has a thought... these guys did not give him a tip. He figures that since there is no way to split \$5.00 evenly three ways anyhow, he will keep two dollars for himself and give them back three dollars.</p> <p>He knocks on the door, and one fellow answers. He explains about a mix-up in the bill, and hands the guy the three dollars, then departs with his two-dollar tip in his pocket.</p> <p>Now the fun begins! $\\$30 - \\$25 = \\$5$ $\\$5 - \\$3 = \\$2$</p> <p>Answer this: Each of the three guys originally gave \$10.00 each. They each got back \$1.00 in change. That means they paid \$9.00 each, which times three is \$27.00. The delivery boy kept \$2.00 for a tip. \$27.00 plus \$2.00 equals \$29.00.</p> <p>Where is the other dollar?</p>						

Marital Relationship Math

Description	Equation	Note
Romance	Smart man + smart woman = romance Smart man + dumb woman = affair Dumb man + smart woman = marriage Dumb man + dumb woman = pregnancy	
Office	Smart boss + smart employee = profit Smart boss + dumb employee = production Dumb boss + smart employee = promotion Dumb boss + dumb employee = overtime	
Shopping	A man will pay \$2 for a \$1 item he needs. A woman will pay \$1 for a \$2 item that she doesn't need.	
Future	A woman worries about the future until she gets a husband. A man never worries about the future until he gets a wife.	
Success	A successful man is one who makes more money than his wife can spend. A successful woman is one who can find such a man.	
Happiness	To be happy with a man, you must understand him a lot and love him a little. To be happy with a woman, you must love her a lot and not try to understand her at all.	
Longevity	Married men live longer than single men do, but married men are a lot more willing to die.	
Propensity to Change	A woman marries a man expecting he will change, but he doesn't. A man marries a woman expecting that she won't change, and she does.	
Discussions	A woman has the last word in any argument. Anything a man says after that is the beginning of a new argument.	
You're Next	Old aunts used to come up to me at weddings, poking me in the ribs and cackling, telling me, "You're next." They stopped after I started doing the same thing to them at funerals.	
Conclusion	Show this list to a smart woman who needs a laugh, and to the smart guys you know can handle it.	



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