A.P. Calculus Name _____

Derivative magic Square

A	B	C
D	E	F
G	H	I

Determine the solution to each of the nine problems labeled A to I below. Then match them to the answers in the second column, placing the corresponding number in each lettered box of the magic square. Check your work by seeing if the following eight sums are the same. If they are, you have found the magic number!

A + B + C = _____ D + E + F = _____

G + H + I = _____ A + E + I = _____

G + E + C = _____ A + D + G = _____

B + E + H = _____ C + F + I = _____

This magic number is an important year in John Handley High School's history. What its significance? _____

_____

Problems

A. Let $f(x) = 2\sin x$.
Then $\frac{d}{dx}\left(f'(x)\right) =$

B. $\frac{d}{dx}\left(\frac{3-x}{x^3}\right) =$

C. If $f(x) = \sin x^2$, $f'(x) =$

D. If $y = \sqrt{x\sin x}$, $y' =$

E. $\frac{d^2}{d^2x}\left(\sec x\right) =$

F. If $y = \sin^2\left(x^2+2\right)$, then $\frac{dy}{dx} =$

G. Determine the 100^{th} derivative of $\sin 3x$.

H. If $h(x) = f(f(x))$, Find $h'(4)$ if $f(4) = -2$, $f'(4) = -4$, and $f'(-2) = 0$.

I. If $f(x) = 3x^4 - 2x^2 + 3x$, Then $f''(x) =$

Answers

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634) $3^{100}\sin 3x$

635) $2\cos x$

636) $\sec x\ \tan x$

637) $\frac{2}{x^3} - \frac{9}{x^4}$

638) $36x^2 - 4$

639) $\frac{\sin x + x\cos x}{2\sqrt{x\sin x}}$

640) $3^{100}\sin 3x$

641) $\sec x\tan^2 x + \sec^3 x$

642) $2x\cos x^2$

643) $4x\sin\left(x^2+2\right)\cos\left(x^2+2\right)$

644) $-2\sin x$

645) 0

646) $4x\sin\left(x^2+2\right)$

647) $3^{100}\cos 3x$

648) 8