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1 Nice Differentials And Evaluations In Integrals

$$\int_{x=0}^{x=3} x^2 \;\mathsf{d}x = \frac{1}{3}x^3\Big|_0^3 = 9$$
$$\int_{x=0}^{x=3} x^2 \;\mathbf{d}x = \left[\frac{1}{3}x^3\right]_0^3 = 9$$
$$\int_{x=0}^{x=3} \mathsf{d}x = x\Big|_0^3 = 3$$
$$\int_{x=0}^{x=3} \mathbf{d}x = \Big[x\Big]_0^3 = 3$$
$$\int_{r=0}^{r=R} r \;\mathsf{d}r \int_{\theta=0}^{\theta=\pi} \sin\theta \;\mathsf{d}\theta \int_{\phi=0}^{\phi=2\pi} \mathsf{d}\phi = \frac{1}{2}r^2\Big|_0^R \cdot -\cos\theta\Big|_0^\pi \cdot \phi\Big|_0^{2\pi} = 4\pi R^2$$
$$\int_{r=0}^{r=R} r \;\mathbf{d}r \int_{\theta=0}^{\theta=\pi} \sin\theta \;\mathbf{d}\theta \int_{\phi=0}^{\phi=2\pi} \mathbf{d}\phi = \left[\frac{1}{2}r^2\right]_0^R \cdot \Big[-\cos\theta\Big]_0^\pi \cdot \Big[\phi\Big]_0^{2\pi} = 4\pi R^2$$

2 Virtual Parentheses

Virtual Parentheses

$$\left(-G\frac{m_1 m_2}{r}\right) \qquad -G\frac{(m_1 m_2)}{r} \qquad -G\left(\frac{m_1 m_2}{r}\right)$$

3 Derivation Environment

New derivation environment

$$E = \gamma m c^2 \tag{1}$$

DERIVATION 1

$x + y = z$	given	(1-1)
$y = z - x$	solve for y	(1-2)
$a = b + c + d + e + f + g + k + l + m + n + o + p + q + r$	a very long expression that came from nowhere	(1-3)

$$E = h\nu \tag{2}$$

DERIVATION 2

$\gamma = \frac{1}{\sqrt{1-v^2}}$	definition	(2-1)
$\gamma^2 = \frac{1}{1-v^2}$	square each side	(2-2)
$\frac{1}{\gamma^2} = 1 - v^2$	take reciprocal of each side	(2-3)
$v = \sqrt{1 - \frac{1}{\gamma^2}}$	rearrange and solve for v to get the final answer	(2-4)

Going from Eq. (2-1) to Eq. (2-4) isn't trivial, but it's quite simple.

$$a^2 + b^2 = c^2 \tag{3}$$

DERIVATION 3

$\gamma = \frac{1}{\sqrt{1-v^2}}$	definition	(3-1)
$\gamma^2 = \frac{1}{1-v^2}$	square each side	(3-2)
$\frac{1}{\gamma^2} = 1 - v^2$	take reciprocal of each side	(3-3)
$v = \sqrt{1 - \frac{1}{\gamma^2}}$	rearrange and solve for v to get the final answer	(3-4)

DERIVATION 4

$\gamma = \frac{1}{\sqrt{1-v^2}}$	definition	(4-1)
$\gamma^2 = \frac{1}{1-v^2}$	square each side	(4-2)
$\frac{1}{\gamma^2} = 1 - v^2$	take reciprocal of each side	(4-3)
$v = \sqrt{1 - \frac{1}{\gamma^2}}$	rearrange and solve for v to get the final answer	(4-4)

DERIVATION 5

$\gamma = \dfrac{1}{\sqrt{1 - v^2}}$	definition	(5-1)
$\gamma^2 = \dfrac{1}{1 - v^2}$	square each side	(5-2)
$\dfrac{1}{\gamma^2} = 1 - v^2$	take reciprocal of each side	(5-3)
$v = \sqrt{1 - \dfrac{1}{\gamma^2}}$	rearrange and solve for v to get the final answer	(5-4)

DERIVATION 6

$\gamma = \dfrac{1}{\sqrt{1 - v^2}}$	definition	(6-1)
$\gamma^2 = \dfrac{1}{1 - v^2}$	square each side	(6-2)
$\dfrac{1}{\gamma^2} = 1 - v^2$	take reciprocal of each side	(6-3)
$v = \sqrt{1 - \dfrac{1}{\gamma^2}}$	rearrange and solve for v to get the final answer	(6-4)

DERIVATION 7

$\gamma = \dfrac{1}{\sqrt{1 - v^2}}$	definition	(7-1)
$\gamma^2 = \dfrac{1}{1 - v^2}$	square each side	(7-2)
$\dfrac{1}{\gamma^2} = 1 - v^2$	take reciprocal of each side	(7-3)
$v = \sqrt{1 - \dfrac{1}{\gamma^2}}$	rearrange and solve for v to get the final answer	(7-4)

DERIVATION 8

$\gamma = \dfrac{1}{\sqrt{1-v^2}}$	definition	(8-1)
$\gamma^2 = \dfrac{1}{1-v^2}$	square each side	(8-2)
$\dfrac{1}{\gamma^2} = 1 - v^2$	take reciprocal of each side	(8-3)
$v = \sqrt{1 - \dfrac{1}{\gamma^2}}$	rearrange and solve for v to get the final answer	(8-4)

DERIVATION 9

$\gamma = \dfrac{1}{\sqrt{1-v^2}}$	definition	(9-1)
$\gamma^2 = \dfrac{1}{1-v^2}$	square each side	(9-2)
$\dfrac{1}{\gamma^2} = 1 - v^2$	take reciprocal of each side	(9-3)
$v = \sqrt{1 - \dfrac{1}{\gamma^2}}$	rearrange and solve for v to get the final answer	(9-4)

DERIVATION 10

$\gamma = \dfrac{1}{\sqrt{1-v^2}}$	definition	(10-1)
$\gamma^2 = \dfrac{1}{1-v^2}$	square each side	(10-2)
$\dfrac{1}{\gamma^2} = 1 - v^2$	take reciprocal of each side	(10-3)
$v = \sqrt{1 - \dfrac{1}{\gamma^2}}$	rearrange and solve for v to get the final answer	(10-4)

$$E_K = \frac{\|\boldsymbol{p}\|^2}{(\gamma+1)m} \tag{4}$$

This equation won't be listed.

$$E^2 = \|\boldsymbol{p}\|^2 c^2 + (mc^2)^2 \tag{5}$$

4 Current Math Fonts

`symnormal`: for vector index notation
*abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ*0123456789
αβγδεεζηθϑικλμνξοπϖρϱσςτυϕφχψωΔΓΘΛΞΠΣΥΦΨΩ
`symbf`: for coordinate-free vectors and matrices
abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ
αβγδεεζηθϑικλμνξοπϖρϱσςτυϕφχψωΔΓΘΛΞΠΣΥΦΨΩ
`symup`: for text labels, particles, and upright Greek
abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789
αβγδεεζηθϑικλμνξοπϖρϱσςτυϕφχψωΔΓΘΛΞΠΣΥΦΨΩ
`symbfup`: for bold text labels
abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789
αβγδεεζηθϑικλμνξοπϖρϱσςτυϕφχψωΔΓΘΛΞΠΣΥΦΨΩ
`symsfup`: for physical dimensions
abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789
αβγδεεζηθϑικλμνξοπϖρϱσςτυϕφχψωΔΓΘΛΞΠΣΥΦΨΩ
`symbfsfup`: available if needed
abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789
αβγδεεζηθϑικλμνξοπϖρϱσςτυϕφχψωΔΓΘΛΞΠΣΥΦΨΩ
`symsfit`: for tensor index notation
abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ
αβγδεεζηθϑικλμνξοπϖρϱσςτυϕφχψωΔΓΘΛΞΠΣΥΦΨΩ
`symbfsfit`: for coordinate-free tensors
abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ
αβγδεεζηθϑικλμνξοπϖρϱσςτυϕφχψωΔΓΘΛΞΠΣΥΦΨΩ
`symcal` and `symbfcal`: for naming points and coordinate systems
$\mathcal{ABCDEFGHIJKLMNOPQRSTUVWXYZ}$
$\boldsymbol{\mathcal{ABCDEFGHIJKLMNOPQRSTUVWXYZ}}$
`symscr` and `symbfscr`: for naming spacetime events
$\mathscr{abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ}$
$\boldsymbol{\mathscr{abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ}}$
`symtt`: available if needed
`abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789`
`symfrak` and `symbffrak`: available if needed
$\mathfrak{abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ}$
$\boldsymbol{\mathfrak{abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ}}$
`symbb` and `symbbit`: available if needed
$\mathbb{abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789}$
ⅆⅇⅈⅉⅅ