

The `linenoamsmath` package*

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This package patches the `amsmath`¹ package to work with the `lineno`² package. The code I've used is largely based on the posts at <https://tex.stackexchange.com/a/461192> and <https://tex.stackexchange.com/a/443201>; credit is due to their author. In addition I've made a few refinements to handle some corner cases.

1 Usage

Just include the package; it will automatically include `amsmath` and `lineno`:

```
\usepackage{linenoamsmath}
...
\linenumbers
... Text with line numbers ...
\begin{align}
... Equations without line numbers ...
\end{align}
```

All options to this package are passed through to `lineno`, so e.g. if you want to add line numbers to equations you can specify the `[mathlines]` option:

```
\usepackage[mathlines]{linenoamsmath}
...
\linenumbers
... Text with line numbers ...
\begin{align}
... Equations with line numbers ...
\end{align}
```

If you need to pass options to `amsmath`, you can include it manually first:

```
\usepackage[...]{amsmath}
\usepackage[mathlines]{linenoamsmath}
```

*This document corresponds to `linenoamsmath` v1.0, dated 2021/09/29.

¹<https://ctan.org/pkg/amsmath>

²<https://ctan.org/pkg/lineno>

2 Demonstration

This section demonstrates that, with this package, line numbers are correctly formatted when using `amsmath` math environments.

1 2.1 Normal text

2 Lorem ipsum dolor sit amet, consectetur adipiscing elit. Ut purus elit, vestibulum
3 ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu
4 libero, nonummy eget, consectetur id, vulputate a, magna.

5 2.2 equation

6 2.3 With line numbers in equations

7 Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor
8 lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus.
9 Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae
10 ornare odio metus a mi.

11 (1)
$$E = mc^2.$$

12 Nulla malesuada porttitor diam. Donec felis erat, congue non, volutpat at, tin-
13 cidunt tristique, libero. Vivamus viverra fermentum felis. Donec nonummy pel-
14 lentesque ante.

15 2.4 Without line numbers in equations

16 Quisque ullamcorper placerat ipsum. Cras nibh. Morbi vel justo vitae lacus
17 tincidunt ultrices. Lorem ipsum dolor sit amet, consectetur adipiscing elit.

(2)
$$E = mc^2.$$

18 Fusce mauris. Vestibulum luctus nibh at lectus. Sed bibendum, nulla a faucibus
19 semper, leo velit ultricies tellus, ac venenatis arcu wisi vel nisl. Vestibulum diam.

20 2.5 equation*

21 2.6 With line numbers in equations

22 Suspendisse vel felis. Ut lorem lorem, interdum eu, tincidunt sit amet, laoreet
23 vitae, arcu. Aenean faucibus pede eu ante. Praesent enim elit, rutrum at, molestie
24 non, nonummy vel, nisl.

25
$$E = mc^2.$$

26 Sed commodo posuere pede. Mauris ut est. Ut quis purus. Sed ac odio.

27 **2.7 Without line numbers in equations**

28 Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac
29 turpis egestas. Donec odio elit, dictum in, hendrerit sit amet, egestas sed, leo.
30 Praesent feugiat sapien aliquet odio. Integer vitae justo.

$$E = mc^2.$$

31 Morbi luctus, wisi viverra faucibus pretium, nibh est placerat odio, nec commodo
32 wisi enim eget quam. Quisque libero justo, consectetur a, feugiat vitae, porttitor
33 eu, libero. Suspendisse sed mauris vitae elit sollicitudin malesuada. Maecenas
34 ultricies eros sit amet ante.

35 **2.8 \[...\]**

36 **2.9 With line numbers in equations**

37 Suspendisse vitae elit. Aliquam arcu neque, ornare in, ullamcorper quis, commodo
38 eu, libero. Fusce sagittis erat at erat tristique mollis. Maecenas sapien libero,
39 molestie et, lobortis in, sodales eget, dui.

40
$$E = mc^2.$$

41 Sed feugiat. Cum sociis natoque penatibus et magnis dis parturient montes, nasce-
42 tur ridiculus mus. Ut pellentesque augue sed urna. Vestibulum diam eros, fringilla
43 et, consectetur eu, nonummy id, sapien.

44 **2.10 Without line numbers in equations**

45 Etiam euismod. Fusce facilisis lacinia dui. Suspendisse potenti. In mi erat, cursus
46 id, nonummy sed, ullamcorper eget, sapien.

$$E = mc^2.$$

47 Aliquam lectus. Vivamus leo. Quisque ornare tellus ullamcorper nulla. Mauris
48 porttitor pharetra tortor.

49 **2.11 multiline**

50 **2.12 With line numbers in equations**

51 Etiam ac leo a risus tristique nonummy. Donec dignissim tincidunt nulla. Vestibu-
52 lum rhoncus molestie odio. Sed lobortis, justo et pretium lobortis, mauris turpis
53 condimentum augue, nec ultricies nibh arcu pretium enim.

54 (3)
$$\frac{1}{1+x} = 1 - x + x^2 - x^3 + x^4 - x^5 + x^6 - x^7 + x^8 - x^9 + \mathcal{O}(x^{10}).$$

55 Nulla in ipsum. Praesent eros nulla, congrue vitae, euismod ut, commodo a, wisi.
56 Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac
57 turpis egestas. Aenean nonummy magna non leo.

$$58 \quad (4) \quad \frac{1}{1+x} = 1 - x + x^2 - x^3 + x^4 - x^5 + x^6 - x^7 + x^8 - x^9 \\ 59 \quad \quad \quad + x^{10} - x^{11} + x^{12} - x^{13} + x^{14} - x^{15} + x^{16} - x^{17} + x^{18} - x^{19} + \mathcal{O}(x^{20}).$$

60 Nulla mattis luctus nulla. Duis commodo velit at leo. Aliquam vulputate magna
61 et leo. Nam vestibulum ullamcorper leo.

62 **2.13 Without line numbers in equations**

63 Curabitur tellus magna, porttitor a, commodo a, commodo in, tortor. Donec
64 interdum. Praesent scelerisque. Maecenas posuere sodales odio.

$$(5) \quad \frac{1}{1+x} = 1 - x + x^2 - x^3 + x^4 - x^5 + x^6 - x^7 + x^8 - x^9 + \mathcal{O}(x^{10}).$$

65 Donec et nisl at wisi luctus bibendum. Nam interdum tellus ac libero. Sed sem
66 justo, laoreet vitae, fringilla at, adipiscing ut, nibh. Maecenas non sem quis tortor
67 eleifend fermentum.

$$(6) \quad \frac{1}{1+x} = 1 - x + x^2 - x^3 + x^4 - x^5 + x^6 - x^7 + x^8 - x^9 \\ \quad \quad \quad + x^{10} - x^{11} + x^{12} - x^{13} + x^{14} - x^{15} + x^{16} - x^{17} + x^{18} - x^{19} + \mathcal{O}(x^{20}).$$

68 Nulla non mauris vitae wisi posuere convallis. Sed eu nulla nec eros scelerisque
69 pharetra. Nullam varius. Etiam dignissim elementum metus.

70 **2.14 multiline***

71 **2.15 With line numbers in equations**

72 Nulla ac nisl. Nullam urna nulla, ullamcorper in, interdum sit amet, gravida ut,
73 risus. Aenean ac enim. In luctus.

$$74 \quad \frac{1}{1+x} = 1 - x + x^2 - x^3 + x^4 - x^5 + x^6 - x^7 + x^8 - x^9 + \mathcal{O}(x^{10}).$$

75 Etiam pede massa, dapibus vitae, rhoncus in, placerat posuere, odio. Vestibulum
76 luctus commodo lacus. Morbi lacus dui, tempor sed, euismod eget, condimentum
77 at, tortor. Phasellus aliquet odio ac lacus tempor faucibus.

$$78 \quad \frac{1}{1+x} = 1 - x + x^2 - x^3 + x^4 - x^5 + x^6 - x^7 + x^8 - x^9 \quad [*] \\ 79 \quad \quad \quad + x^{10} - x^{11} + x^{12} - x^{13} + x^{14} - x^{15} + x^{16} - x^{17} + x^{18} - x^{19} + \mathcal{O}(x^{20}).$$

80 Etiam suscipit aliquam arcu. Aliquam sit amet est ac purus bibendum congrue.
81 Sed in eros. Morbi non orci.

82 **2.16 Without line numbers in equations**

83 Donec et nisl id sapien blandit mattis. Aenean dictum odio sit amet risus. Morbi
84 purus. Nulla a est sit amet purus venenatis iaculis.

$$\frac{1}{1+x} = 1 - x + x^2 - x^3 + x^4 - x^5 + x^6 - x^7 + x^8 - x^9 + \mathcal{O}(x^{10}).$$

85 Maecenas non massa. Vestibulum pharetra nulla at lorem. Duis quis quam id
86 lacus dapibus interdum. Nulla lorem.

$$\begin{aligned} \frac{1}{1+x} = & 1 - x + x^2 - x^3 + x^4 - x^5 + x^6 - x^7 + x^8 - x^9 \\ & + x^{10} - x^{11} + x^{12} - x^{13} + x^{14} - x^{15} + x^{16} - x^{17} + x^{18} - x^{19} + \mathcal{O}(x^{20}). \end{aligned}$$

87 Vivamus eu tellus sed tellus consequat suscipit. Nam orci orci, malesuada id,
88 gravida nec, ultricies vitae, erat. Donec risus turpis, luctus sit amet, interdum
89 quis, porta sed, ipsum. Suspendisse condimentum, tortor at egestas posuere, neque
90 metus tempor orci, et tincidunt urna nunc a purus.

91 **2.17 gather**

92 **2.18 With line numbers in equations**

93 Duis aliquet dui in est. Donec eget est. Nunc lectus odio, varius at, fermentum
94 in, accumsan non, enim. Aliquam erat volutpat.

95 (7)
$$E = mc^2.$$

96 Donec vel nibh ut felis consectetur laoreet. Donec pede. Sed id quam id wisi
97 laoreet suscipit. Nulla lectus dolor, aliquam ac, fringilla eget, mollis ut, orci.

98 (8)
$$E = mc^2,$$

99 (9)
$$E^2 = p^2c^2 + m_0^2c^4.$$

100 Donec molestie, magna ut luctus ultrices, tellus arcu nonummy velit, sit amet
101 pulvinar elit justo et mauris. In pede. Maecenas euismod elit eu erat. Aliquam
102 augue wisi, facilisis congue, suscipit in, adipiscing et, ante.

103 **2.19 Without line numbers in equations**

104 Cras dapibus, augue quis scelerisque ultricies, felis dolor placerat sem, id porta
105 velit odio eu elit. Aenean interdum nibh sed wisi. Praesent sollicitudin vulputate
106 dui. Praesent iaculis viverra augue.

(10)
$$E = mc^2.$$

107 Sed mattis, erat sit amet gravida malesuada, elit augue egestas diam, tempus
108 scelerisque nunc nisl vitae libero. Sed consequat feugiat massa. Nunc porta, eros

109 in eleifend varius, erat leo rutrum dui, non convallis lectus orci ut nibh. Sed lorem
110 massa, nonummy quis, egestas id, condimentum at, nisl.

$$(11) \quad E = mc^2,$$
$$(12) \quad E^2 = p^2c^2 + m_0^2c^4.$$

111 Sed consequat tellus et tortor. Ut tempor laoreet quam. Nullam id wisi a libero
112 tristique semper. Nullam nisl massa, rutrum ut, egestas semper, mollis id, leo.

113 **2.20** gather*

114 **2.21** With line numbers in equations

115 Phasellus id magna. Duis malesuada interdum arcu. Integer metus. Morbi pulv-
116 inar pellentesque mi.

$$117 \quad E = mc^2.$$

118 Sed eleifend, eros sit amet faucibus elementum, urna sapien consectetur mauris,
119 quis egestas leo justo non risus. Morbi non felis ac libero vulputate fringilla.
120 Mauris libero eros, lacinia non, sodales quis, dapibus porttitor, pede. Class aptent
121 taciti sociosqu ad litora torquent per conubia nostra, per inceptos hymenaeos.

$$122 \quad E = mc^2, \quad [*]$$
$$123 \quad E^2 = p^2c^2 + m_0^2c^4.$$

124 Nullam eleifend justo in nisl. In hac habitasse platea dictumst. Morbi nonummy.
125 Aliquam ut felis.

126 **2.22** Without line numbers in equations

127 Class aptent taciti sociosqu ad litora torquent per conubia nostra, per inceptos
128 hymenaeos. Aenean nonummy turpis id odio. Integer euismod imperdiet turpis.
129 Ut nec leo nec diam imperdiet lacinia.

$$E = mc^2.$$

130 Nulla malesuada risus ut urna. Aenean pretium velit sit amet metus. Duis iaculis.
131 In hac habitasse platea dictumst.

$$E = mc^2,$$
$$E^2 = p^2c^2 + m_0^2c^4.$$

132 Donec tempus neque vitae est. Aenean egestas odio sed risus ullamcorper ullam-
133 corper. Sed in nulla a tortor tincidunt egestas. Nam sapien tortor, elementum sit
134 amet, aliquam in, porttitor faucibus, enim.

135 **2.23 align**

136 **2.24 With line numbers in equations**

137 Fusce suscipit cursus sem. Vivamus risus mi, egestas ac, imperdiet varius, faucibus
138 quis, leo. Aenean tincidunt. Donec suscipit.

139 (13)
$$\nabla \cdot \vec{E} = 0, \quad \nabla \times \vec{E} = -\frac{\partial \vec{B}}{\partial t}.$$

140 Praesent sed neque id pede mollis rutrum. Vestibulum iaculis risus. Pellentesque
141 lacus. Ut quis nunc sed odio malesuada egestas.

142 (14)
$$\nabla \cdot \vec{E} = 0, \quad \nabla \times \vec{E} = -\frac{\partial \vec{B}}{\partial t},$$

143 (15)
$$\nabla \cdot \vec{B} = 0, \quad \nabla \times \vec{B} = \frac{1}{c^2} \frac{\partial \vec{E}}{\partial t}.$$

144 Sed gravida lectus ut purus. Morbi laoreet magna. Pellentesque eu wisi. Proin
145 turpis.

146 **2.25 Without line numbers in equations**

147 Curabitur ac lorem. Vivamus non justo in dui mattis posuere. Etiam accumsan
148 ligula id pede. Maecenas tincidunt diam nec velit.

(16)
$$\nabla \cdot \vec{E} = 0, \quad \nabla \times \vec{E} = -\frac{\partial \vec{B}}{\partial t}.$$

149 Quisque consectetur. In suscipit mauris a dolor pellentesque consectetur. Mauris
150 convallis neque non erat. In lacinia.

(17)
$$\nabla \cdot \vec{E} = 0, \quad \nabla \times \vec{E} = -\frac{\partial \vec{B}}{\partial t},$$

(18)
$$\nabla \cdot \vec{B} = 0, \quad \nabla \times \vec{B} = \frac{1}{c^2} \frac{\partial \vec{E}}{\partial t}.$$

151 Maecenas accumsan dapibus sapien. Duis pretium iaculis arcu. Curabitur ut
152 lacus. Aliquam vulputate.

153 **2.26 align***

154 **2.27 With line numbers in equations**

155 Phasellus fringilla, metus id feugiat consectetur, lacus wisi ultrices tellus, quis
156 lobortis nibh lorem quis tortor. Donec egestas ornare nulla. Mauris mi tellus,
157 porta faucibus, dictum vel, nonummy in, est. Aliquam erat volutpat.

158
$$\nabla \cdot \vec{E} = 0, \quad \nabla \times \vec{E} = -\frac{\partial \vec{B}}{\partial t}.$$

159 Cras egestas ipsum a nisl. Vivamus varius dolor ut dolor. Fusce vel enim. Pellentesque accumsan ligula et eros.

$$161 \quad \nabla \cdot \vec{E} = 0, \quad \nabla \times \vec{E} = -\frac{\partial \vec{B}}{\partial t}, \quad [*]$$
$$162 \quad \nabla \cdot \vec{B} = 0, \quad \nabla \times \vec{B} = \frac{1}{c^2} \frac{\partial \vec{E}}{\partial t}.$$

163 In hac habitasse platea dictumst. Proin at est. Curabitur tempus vulputate elit.
164 Pellentesque sem.

165 2.28 Without line numbers in equations

166 Donec in nisl. Fusce vitae est. Vivamus ante ante, mattis laoreet, posuere eget,
167 congue vel, nunc. Fusce sem.

$$\nabla \cdot \vec{E} = 0, \quad \nabla \times \vec{E} = -\frac{\partial \vec{B}}{\partial t}.$$

168 Morbi justo. Aenean nec dolor. In hac habitasse platea dictumst. Proin nonummy
169 porttitor velit.

$$\nabla \cdot \vec{E} = 0, \quad \nabla \times \vec{E} = -\frac{\partial \vec{B}}{\partial t},$$
$$\nabla \cdot \vec{B} = 0, \quad \nabla \times \vec{B} = \frac{1}{c^2} \frac{\partial \vec{E}}{\partial t}.$$

170 Vivamus sodales elementum neque. Vivamus dignissim accumsan neque. Sed at
171 enim. Vestibulum nonummy interdum purus.

172 2.29 alignat

173 2.30 With line numbers in equations

174 Quisque facilisis auctor sapien. Pellentesque gravida hendrerit lectus. Mauris
175 rutrum sodales sapien. Fusce hendrerit sem vel lorem.

$$176 \quad (19) \quad \nabla \cdot \vec{E} = 0, \quad \nabla \times \vec{E} = -\frac{\partial \vec{B}}{\partial t}.$$

177 Maecenas dui. Aliquam volutpat auctor lorem. Cras placerat est vitae lectus.
178 Curabitur massa lectus, rutrum euismod, dignissim ut, dapibus a, odio.

$$179 \quad (20) \quad \nabla \cdot \vec{E} = 0, \quad \nabla \times \vec{E} = -\frac{\partial \vec{B}}{\partial t},$$

$$180 \quad (21) \quad \nabla \cdot \vec{B} = 0, \quad \nabla \times \vec{B} = \frac{1}{c^2} \frac{\partial \vec{E}}{\partial t}.$$

181 Donec vitae velit. Suspendisse porta fermentum mauris. Ut vel nunc non mauris
182 pharetra varius. Duis consequat libero quis urna.

183 **2.31 Without line numbers in equations**

184 Phasellus placerat vulputate quam. Maecenas at tellus. Pellentesque neque diam,
185 dignissim ac, venenatis vitae, consequat ut, lacus. Nam nibh.

$$(22) \quad \nabla \cdot \vec{E} = 0, \quad \nabla \times \vec{E} = -\frac{\partial \vec{B}}{\partial t}.$$

186 Morbi nunc. Aliquam consetetur varius nulla. Phasellus eros. Cras dapibus
187 porttitor risus.

$$(23) \quad \nabla \cdot \vec{E} = 0, \quad \nabla \times \vec{E} = -\frac{\partial \vec{B}}{\partial t},$$

$$(24) \quad \nabla \cdot \vec{B} = 0, \quad \nabla \times \vec{B} = \frac{1}{c^2} \frac{\partial \vec{E}}{\partial t}.$$

188 Nunc velit. Nullam elit sapien, eleifend eu, commodo nec, semper sit amet, elit.
189 Nulla lectus risus, condimentum ut, laoreet eget, viverra nec, odio. Proin lobortis.

190 **2.32 alignat***

191 **2.33 With line numbers in equations**

192 Morbi tincidunt posuere arcu. Cras venenatis est vitae dolor. Vivamus scelerisque
193 semper mi. Donec ipsum arcu, consequat scelerisque, viverra id, dictum at, metus.

$$194 \quad \nabla \cdot \vec{E} = 0, \quad \nabla \times \vec{E} = -\frac{\partial \vec{B}}{\partial t}.$$

195 Aenean laoreet aliquam orci. Nunc interdum elementum urna. Quisque erat.
196 Nullam tempor neque.

$$197 \quad \nabla \cdot \vec{E} = 0, \quad \nabla \times \vec{E} = -\frac{\partial \vec{B}}{\partial t}, \quad [*]$$

$$198 \quad \nabla \cdot \vec{B} = 0, \quad \nabla \times \vec{B} = \frac{1}{c^2} \frac{\partial \vec{E}}{\partial t}.$$

199 Aenean scelerisque. Fusce pretium porttitor lorem. In hac habitasse platea dic-
200 tumst. Nulla sit amet nisl at sapien egestas pretium.

201 **2.34 Without line numbers in equations**

202 Ut quis wisi. Praesent quis massa. Vivamus egestas risus eget lacus. Nunc tin-
203 cidunt, risus quis bibendum facilisis, lorem purus rutrum neque, nec porta tortor
204 urna quis orci.

$$\nabla \cdot \vec{E} = 0, \quad \nabla \times \vec{E} = -\frac{\partial \vec{B}}{\partial t}.$$

205 Vivamus commodo eros eleifend dui. Vestibulum in leo eu erat tristique mattis.
206 Cras at elit. Cras pellentesque.

$$\begin{aligned}\nabla \cdot \vec{E} &= 0, & \nabla \times \vec{E} &= -\frac{\partial \vec{B}}{\partial t}, \\ \nabla \cdot \vec{B} &= 0, & \nabla \times \vec{B} &= \frac{1}{c^2} \frac{\partial \vec{E}}{\partial t}.\end{aligned}$$

207 Morbi sem. Nulla facilisi. Vestibulum ante ipsum primis in faucibus orci luctus et
208 ultrices posuere cubilia Curae; Nulla facilisi. Morbi sagittis ultrices libero.

209 **2.35** flalign

210 **2.36** With line numbers in equations

211 Fusce tristique risus id wisi. Integer molestie massa id sem. Vestibulum vel dolor.
212 Pellentesque vel urna vel risus ultricies elementum.

213 (25)
$$\nabla \cdot \vec{E} = 0, \quad \nabla \times \vec{E} = -\frac{\partial \vec{B}}{\partial t}.$$

214 Aliquam tortor. Morbi ipsum massa, imperdiet non, consectetur vel, feugiat vel,
215 lorem. Quisque eget lorem nec elit malesuada vestibulum. Quisque sollicitudin
216 ipsum vel sem.

217 (26)
$$\nabla \cdot \vec{E} = 0, \quad \nabla \times \vec{E} = -\frac{\partial \vec{B}}{\partial t},$$

218 (27)
$$\nabla \cdot \vec{B} = 0, \quad \nabla \times \vec{B} = \frac{1}{c^2} \frac{\partial \vec{E}}{\partial t}.$$

219 Vivamus sit amet pede. Duis interdum, nunc eget rutrum dignissim, nisl diam
220 luctus leo, et tincidunt velit nisl id tellus. In lorem tellus, aliquet vitae, porta in,
221 aliquet sed, lectus. Phasellus sodales.

222 **2.37** Without line numbers in equations

223 Etiam vel ipsum. Morbi facilisis vestibulum nisl. Praesent cursus laoreet felis.
224 Integer adipiscing pretium orci.

(28)
$$\nabla \cdot \vec{E} = 0, \quad \nabla \times \vec{E} = -\frac{\partial \vec{B}}{\partial t}.$$

225 Nunc sed pede. Praesent vitae lectus. Praesent neque justo, vehicula eget, inter-
226 dum id, facilisis et, nibh. Phasellus at purus et libero lacinia dictum.

(29)
$$\nabla \cdot \vec{E} = 0, \quad \nabla \times \vec{E} = -\frac{\partial \vec{B}}{\partial t},$$

(30)
$$\nabla \cdot \vec{B} = 0, \quad \nabla \times \vec{B} = \frac{1}{c^2} \frac{\partial \vec{E}}{\partial t}.$$

227 Donec a nibh ut elit vestibulum tristique. Integer at pede. Cras volutpat varius
228 magna. Phasellus eu wisi.

229 **2.38** flalign*

230 **2.39** With line numbers in equations

231 Integer placerat. Pellentesque habitant morbi tristique senectus et netus et male-
232 suada fames ac turpis egestas. Sed in massa. Class aptent taciti sociosqu ad litora
233 torquent per conubia nostra, per inceptos hymenaeos.

$$234 \quad \nabla \cdot \vec{E} = 0, \quad \nabla \times \vec{E} = -\frac{\partial \vec{B}}{\partial t}.$$

235 Mauris tempus eros at nulla. Sed quis dui dignissim mauris pretium tincidunt.
236 Mauris ac purus. Phasellus ac libero.

$$237 \quad \nabla \cdot \vec{E} = 0, \quad \nabla \times \vec{E} = -\frac{\partial \vec{B}}{\partial t}, \quad [*]$$

$$238 \quad \nabla \cdot \vec{B} = 0, \quad \nabla \times \vec{B} = \frac{1}{c^2} \frac{\partial \vec{E}}{\partial t}.$$

239 Ut auctor, augue porta dignissim vestibulum, arcu diam lobortis velit, vel
240 scelerisque risus augue sagittis risus. Maecenas eu justo. Pellentesque habitant
241 morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris
242 congue ligula eget tortor.

243 **2.40** Without line numbers in equations

244 Aenean tincidunt laoreet dui. Vestibulum ante ipsum primis in faucibus orci luctus
245 et ultrices posuere cubilia Curae; Integer ipsum lectus, fermentum ac, malesuada
246 in, eleifend ut, lorem. Vivamus ipsum turpis, elementum vel, hendrerit ut, semper
247 at, metus. Vivamus sapien tortor, eleifend id, dapibus in, egestas et, pede.

$$\nabla \cdot \vec{E} = 0, \quad \nabla \times \vec{E} = -\frac{\partial \vec{B}}{\partial t}.$$

248 Praesent facilisis, augue a adipiscing venenatis, libero risus molestie odio, pulvinar
249 consectetur felis erat ac mauris. Nam vestibulum rhoncus quam. Sed velit urna,
250 pharetra eu, eleifend eu, viverra at, wisi. Maecenas ultrices nibh at turpis.

$$\nabla \cdot \vec{E} = 0, \quad \nabla \times \vec{E} = -\frac{\partial \vec{B}}{\partial t},$$
$$\nabla \cdot \vec{B} = 0, \quad \nabla \times \vec{B} = \frac{1}{c^2} \frac{\partial \vec{E}}{\partial t}.$$

251 Integer vel enim sed turpis adipiscing bibendum. Vestibulum pede dolor, laoreet
252 nec, posuere in, nonummy in, sem. Donec imperdiet sapien placerat erat. Donec
253 viverra.

3 Implementation

All options to this package are passed through to `lineno`.

```
1 \DeclareOption*{\PassOptionsToPackage{\CurrentOption}{lineno}}
2 \ProcessOptions\relax
```

Include `amsmath` and `lineno`.

```
3 \RequirePackage{amsmath}
4 \RequirePackage{lineno}
```

Needs `etoolbox` for patching macros.

```
5 \RequirePackage{etoolbox}
```

Patch math environments:

- Setting `\postdisplaypenalty=0` removes extra line numbers from `amsmath` math environments.
- Patching `\math@cr@` to add `\linenoamsmath@ams@eqpen` to `\@eqpen`, then setting `\linenoamsmath@ams@eqpen` to `\interdisplaylinepenalty`, preserves line numbers when equations are separated using the `*` line break instead of `\\`.

```
6 \newcommand*\linenoamsmath@patch[1]{%
7   \cspreto{#1}{\linenomath}%
8   \cspreto{#1*}{\linenomath}%
9   \csappto{end#1}{\endlinenomath}%
10  \csappto{end#1*}{\endlinenomath}%
11 }
12 \newcount\linenoamsmath@ams@eqpen
13 \cspreto{math@cr@}{\global\@eqpen\numexpr\@eqpen+\linenoamsmath@ams@eqpen\relax}
14 \newcommand*\linenoamsmath@patch@ams[1]{%
15   \cspreto{#1}{%
16     \linenomath%
17     \postdisplaypenalty=0%
18     \global\linenoamsmath@ams@eqpen\interdisplaylinepenalty%
19   }%
20   \cspreto{#1*}{%
21     \linenomath%
22     \postdisplaypenalty=0%
23     \global\linenoamsmath@ams@eqpen\interdisplaylinepenalty%
24   }%
25   \csappto{end#1}{%
26     \global\linenoamsmath@ams@eqpen\z@%
27     \endlinenomath%
28   }%
29   \csappto{end#1*}{%
30     \global\linenoamsmath@ams@eqpen\z@%
31     \endlinenomath%
32   }%
33 }
```

```

34 \linoamsmath@patch{equation}
35 \linoamsmath@patch@ams{multline}
36 \linoamsmath@patch@ams{gather}
37 \linoamsmath@patch@ams{align}
38 \linoamsmath@patch@ams{alignat}
39 \linoamsmath@patch@ams{flalign}

```

Patch `\mmeasure@` which is used internally by `multline`:

- Setting `\interdisplaylinepenalty=0` removes an extra line number from the beginning of a multi-line `multline` where line numbers in equations are turned on.
- Adding `\\` to the end of the argument of `\mmeasure@` removes an extra line number from the beginning of a single-line `multline` where line numbers in equations are turned off.
- Need to set `\linoamsmath@ams@eqpen` to zero while in this macro to avoid creating extra line numbers.

```

40 \let\linoamsmath@ams@mmeasure\mmeasure@
41 \def\mmeasure@#1{%
42   \global\linoamsmath@ams@eqpen\z@%
43   \begingroup%
44   \interdisplaylinepenalty=0%
45   \linoamsmath@ams@mmeasure{#1\\}%
46   \endgroup%
47   \global\linoamsmath@ams@eqpen\interdisplaylinepenalty%
48 }

```

Change History

v1.0
 General: Initial version 1