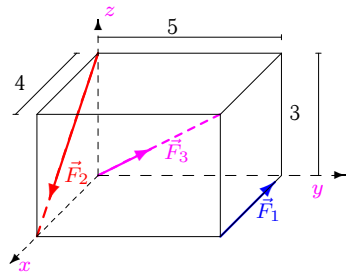
# Приведение системы сил

Систему трех сил, приложенных к вершинам параллелепипеда, привести к началу координат. Найти координаты точки пересечения центральной винтовой оси с плоскостью $xy$. Размеры на рисунках даны в м, силы — в Н.

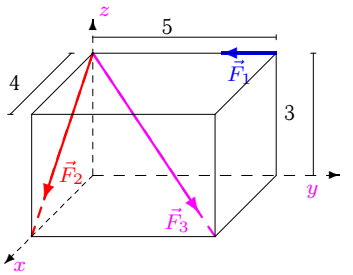
*Кирсанов М.Н.* **Решебник. Теоретическая механика**/Под ред. А. И. Кириллова.– М.: ФИЗМАТЛИТ, 2008. — 384 с. (с.111.)

**Задача 12.1.** 4



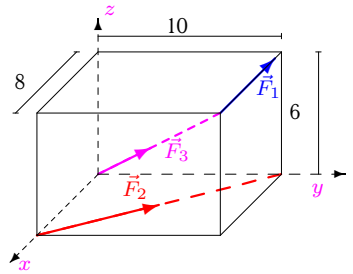

$F_1 = 3,\ F_2 = 3,\ F_3 = 5.$

**Задача 12.2.** 4



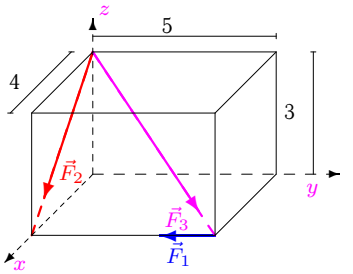

$F_1 = 2,\ F_2 = 2,\ F_3 = 5.$

**Задача 12.3.** 4



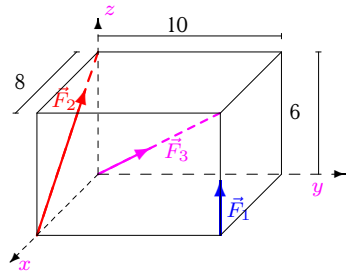

$F_1 = 4,\ F_2 = 5,\ F_3 = 7.$

**Задача 12.4.** 4



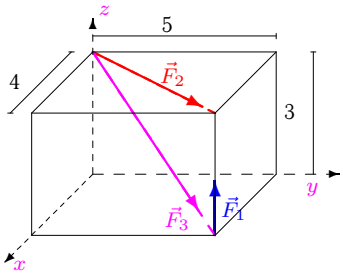

$F_1 = 3,\ F_2 = 3,\ F_3 = 6.$

**Задача 12.5.** 4



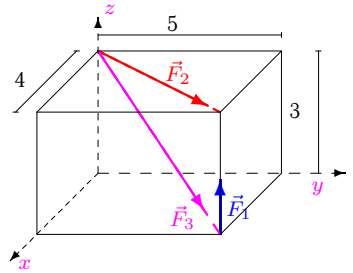

$F_1 = 3,\ F_2 = 4,\ F_3 = 5.$

**Задача 12.6.** 4



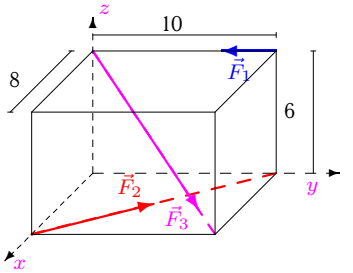

$F_1 = 3,\ F_2 = 3,\ F_3 = 4.$

**Задача 12.7.** 4



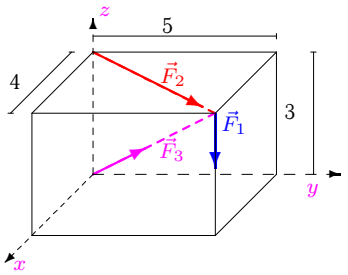

$F_1 = 3,\ F_2 = 3,\ F_3 = 4.$

**Задача 12.8.** 4



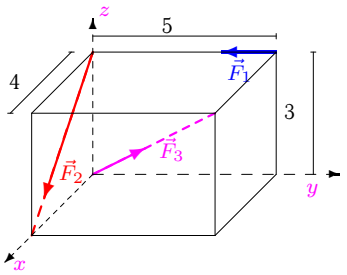

$F_1 = 2,\ F_2 = 3,\ F_3 = 6.$

**Задача 12.9.** 4



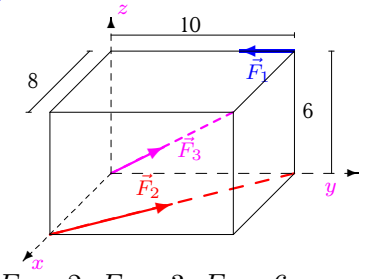

$F_1 = 4,\ F_2 = 4,\ F_3 = 5.$

**Задача 12.10.** 4



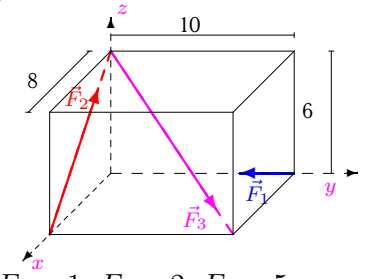

$F_1 = 2,\ F_2 = 2,\ F_3 = 5.$

**Задача 12.11.** 4



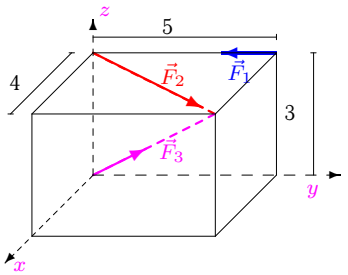

$F_1 = 2,\ F_2 = 3,\ F_3 = 6.$

**Задача 12.12.** 4



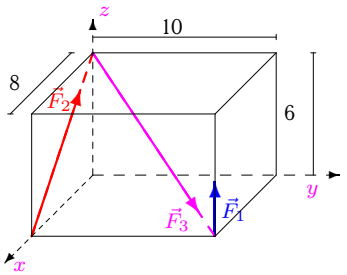

$F_1 = 1,\ F_2 = 2,\ F_3 = 5.$

**Задача 12.13.** 4



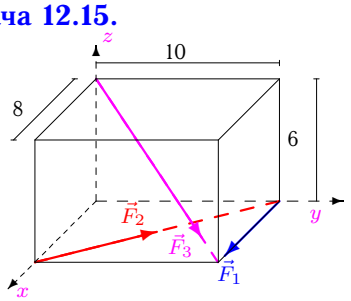

$F_1 = 2,\ F_2 = 2,\ F_3 = 5.$

**Задача 12.14.** 4



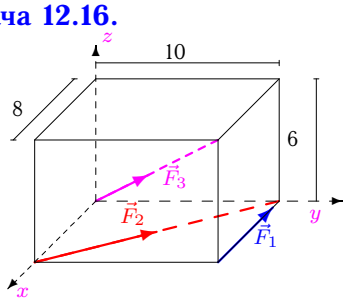

$F_1 = 3,\ F_2 = 4,\ F_3 = 5.$

**Задача 12.15.** 4



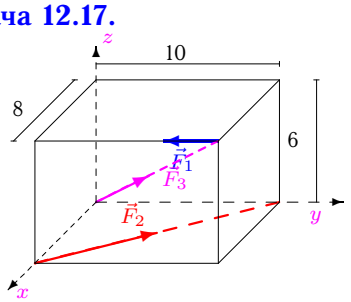

$F_1 = 1,\ F_2 = 2,\ F_3 = 4.$

**Задача 12.16.** 4



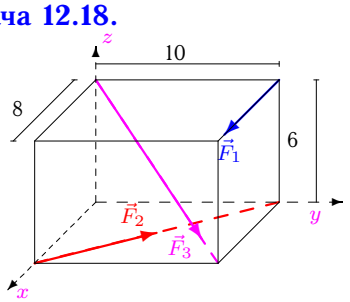

$F_1 = 3,\ F_2 = 4,\ F_3 = 6.$

**Задача 12.17.** 4



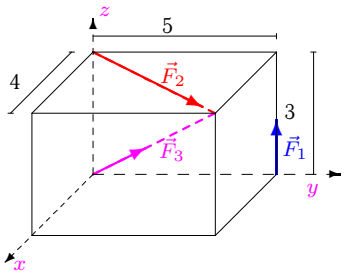

$F_1 = 4,\ F_2 = 5,\ F_3 = 8.$

**Задача 12.18.** 4



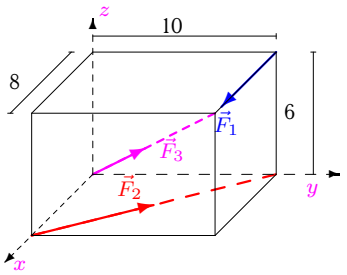

$F_1 = 2,\ F_2 = 3,\ F_3 = 5.$

**Задача 12.19.** 4



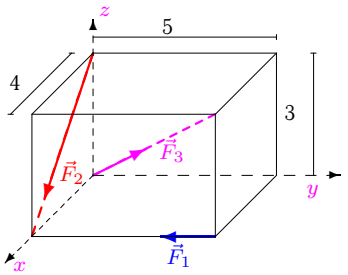

$F_1 = 1,\ F_2 = 1,\ F_3 = 2.$

**Задача 12.20.** 4



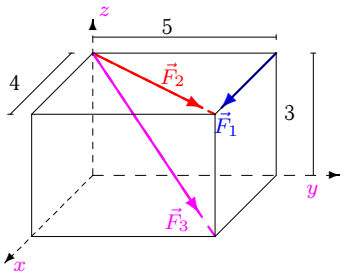

$F_1 = 2,\ F_2 = 3,\ F_3 = 5.$

**Задача 12.21.** 4



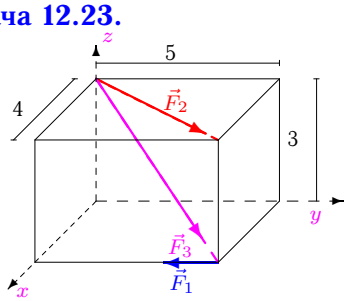

$F_1 = 3,\ F_2 = 3,\ F_3 = 6.$

**Задача 12.22.** 4



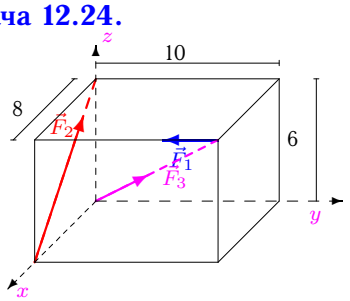

$F_1 = 2,\ F_2 = 2,\ F_3 = 4.$

**Задача 12.23.** 4



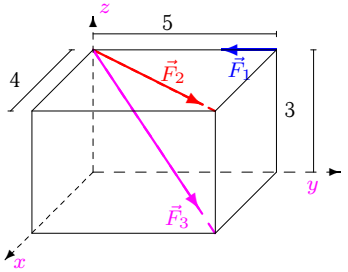

$F_1 = 3,\ F_2 = 3,\ F_3 = 6.$

**Задача 12.24.** 4



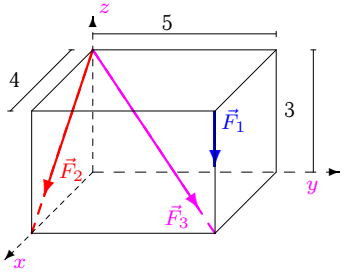

$F_1 = 4,\ F_2 = 5,\ F_3 = 8.$

**Задача 12.25.** 4



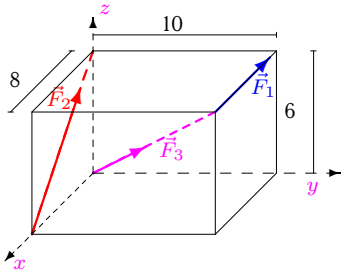

$F_1 = 2,\ F_2 = 2,\ F_3 = 5.$

**Задача 12.26.** 4



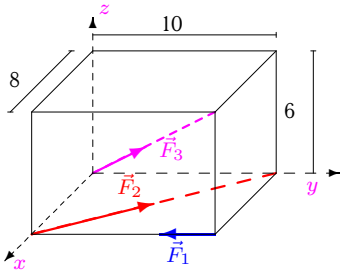

$F_1 = 4,\ F_2 = 4,\ F_3 = 5.$

**Задача 12.27.** 4



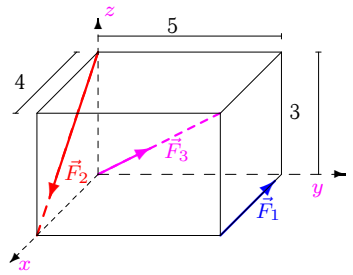

$F_1 = 4,\ F_2 = 5,\ F_3 = 7.$

**Задача 12.28.** 4



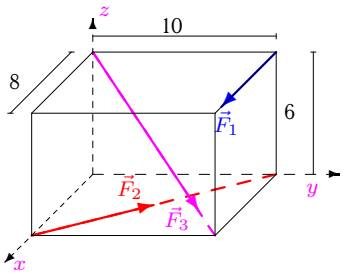

$F_1 = 3,\ F_2 = 4,\ F_3 = 7.$

**Задача 12.29.** 4



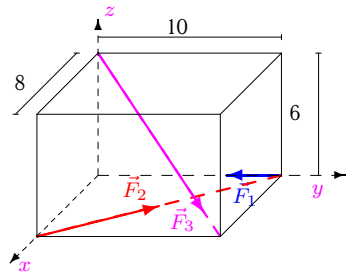

$F_1 = 3,\ F_2 = 3,\ F_3 = 5.$

**Задача 12.30.** 4



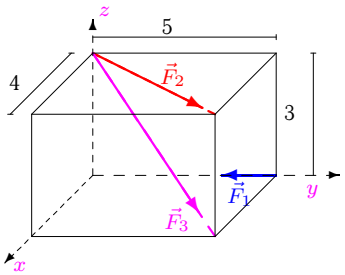

$F_1 = 2,\ F_2 = 3,\ F_3 = 5.$

**Задача 12.31.** 4



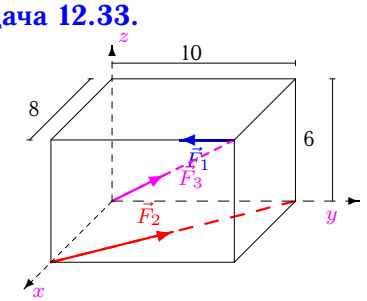

$F_1 = 1,\ F_2 = 2,\ F_3 = 5.$

**Задача 12.32.** 4



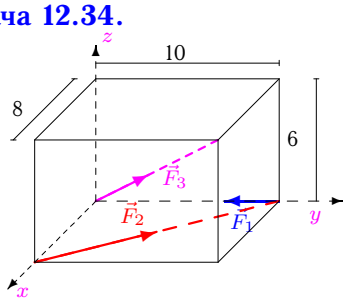

$F_1 = 1,\ F_2 = 1,\ F_3 = 4.$

**Задача 12.33.** 4




$F_1 = 4,\ F_2 = 5,\ F_3 = 8.$

**Задача 12.34.** 4




$F_1 = 1,\ F_2 = 2,\ F_3 = 5.$

12.4

# Приведение системы сил

| | $R_x$ | $R_y$ | $R_z$ | $R$ | $M_x$ | $M_y$ | $M_z$ | $M$ | $I$ | $M_{min}$ | $x_A$ | $y_A$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2.228 | 3.536 | 0.321 | 4.192 | 0.000 | 7.200 | 15.000 | 16.639 | 30.276 | 7.223 | -3.447 | -11.951 |
| 2 | 4.428 | 1.536 | -3.321 | 5.745 | -4.607 | 13.285 | 0.000 | 14.061 | 0.000 | 0.000 | 4.000 | 1.387 |
| 3 | -3.164 | 8.854 | 2.970 | 9.860 | 0.000 | -24.000 | 71.235 | 75.169 | -0.942 | -0.096 | 8.052 | -0.010 |
| 4 | 5.794 | 1.243 | -4.346 | 7.348 | -12.728 | 17.382 | -12.000 | 24.661 | -0.000 | -0.000 | 4.000 | 2.929 |
| 5 | -0.372 | 3.536 | 7.521 | 8.319 | 30.000 | -43.200 | 0.000 | 52.595 | -163.882 | -19.699 | 4.631 | 3.872 |
| 6 | 4.137 | 5.171 | 1.303 | 6.749 | -0.513 | 0.410 | 0.000 | 0.657 | -0.000 | -0.000 | -0.315 | -0.394 |
| 7 | 4.137 | 5.171 | 1.303 | 6.749 | -0.513 | 0.410 | 0.000 | 0.657 | -0.000 | -0.000 | -0.315 | -0.394 |
| 8 | 1.520 | 4.585 | -2.546 | 5.460 | -13.456 | 20.365 | 18.741 | 30.773 | 25.217 | 4.618 | 6.477 | 5.791 |
| 9 | 5.327 | 6.659 | -1.879 | 8.732 | -29.370 | 23.496 | 0.000 | 37.612 | 0.000 | 0.000 | 12.507 | 15.634 |
| 10 | 4.428 | 1.536 | 0.921 | 4.777 | 6.000 | 4.800 | 0.000 | 7.684 | 33.941 | 7.105 | -2.731 | -0.637 |
| 11 | 1.520 | 4.585 | 2.546 | 5.460 | 12.000 | 0.000 | 18.741 | 22.254 | 65.947 | 12.077 | 3.984 | 3.393 |
| 12 | 1.228 | 2.536 | -0.921 | 2.964 | -21.213 | 7.371 | 0.000 | 22.457 | -7.371 | -2.486 | 10.308 | 21.906 |
| 13 | 4.078 | 3.097 | 2.121 | 5.543 | 1.315 | 3.748 | 0.000 | 3.972 | 16.971 | 3.062 | -0.960 | -0.442 |
| 14 | -0.372 | 3.536 | 3.279 | 4.836 | 8.787 | -26.229 | 0.000 | 27.662 | -96.000 | -19.851 | 3.574 | 2.215 |
| 15 | 2.013 | 4.390 | -1.697 | 5.119 | -16.971 | 13.576 | 2.494 | 21.876 | 21.203 | 4.142 | 5.907 | 10.960 |
| 16 | -2.105 | 7.366 | 2.546 | 8.073 | 0.000 | 0.000 | 54.988 | 54.988 | 139.976 | 17.339 | 6.215 | 1.776 |
| 17 | 1.402 | 5.561 | 3.394 | 6.664 | 24.000 | 0.000 | -0.765 | 24.012 | 31.051 | 4.659 | 1.146 | 6.782 |
| 18 | 2.954 | 5.878 | -2.121 | 6.912 | -21.213 | 28.971 | -1.259 | 35.929 | 110.293 | 15.956 | 7.261 | 13.215 |
| 19 | 1.756 | 2.195 | 1.849 | 3.364 | 2.657 | 1.874 | 0.000 | 3.252 | 8.780 | 2.610 | -0.093 | 0.701 |
| 20 | 2.954 | 5.878 | 2.121 | 6.912 | 0.000 | 12.000 | -1.259 | 12.066 | 67.867 | 9.818 | -1.721 | -1.978 |
| 21 | 5.794 | 1.243 | 0.746 | 5.973 | 0.000 | 7.200 | -12.000 | 13.994 | 0.000 | 0.000 | -9.657 | -0.000 |
| 22 | 5.512 | 4.390 | -1.697 | 7.248 | -13.170 | 16.536 | -10.000 | 23.386 | 16.971 | 2.341 | 8.909 | 8.810 |
| 23 | 5.268 | 3.585 | -2.546 | 6.862 | -19.756 | 15.805 | -12.000 | 28.001 | -16.867 | -2.458 | 6.713 | 7.019 |
| 24 | 0.525 | 1.657 | 6.394 | 6.626 | 24.000 | -24.000 | -32.000 | 46.648 | -231.765 | -34.977 | 2.386 | 4.187 |
| 25 | 4.078 | 3.097 | -2.121 | 5.543 | -9.292 | 12.233 | 0.000 | 15.362 | -0.000 | -0.000 | 5.767 | 4.380 |
| 26 | 6.028 | 3.536 | -8.521 | 11.021 | -30.607 | 34.085 | 0.000 | 45.810 | -64.000 | -5.807 | 4.219 | 3.219 |
| 27 | -4.040 | 4.950 | 5.970 | 8.744 | 0.000 | -48.000 | 40.000 | 62.482 | 1.206 | 0.138 | 8.053 | 0.011 |
| 28 | 1.461 | 5.073 | 2.970 | 6.057 | 0.000 | 0.000 | 0.988 | 0.988 | 2.934 | 0.484 | 0.137 | -0.039 |
| 29 | 2.228 | 3.536 | 0.321 | 4.192 | 0.000 | 7.200 | 15.000 | 16.639 | 30.276 | 7.223 | -3.447 | -11.951 |
| 30 | 2.954 | 5.878 | -2.121 | 6.912 | -21.213 | 28.971 | -1.259 | 35.929 | 110.293 | 15.956 | 7.261 | 13.215 |
| 31 | 1.579 | 4.097 | -2.121 | 4.877 | -21.213 | 16.971 | 12.494 | 29.901 | 9.533 | 1.955 | 7.226 | 10.298 |
| 32 | 2.887 | 2.609 | -1.697 | 4.246 | -10.828 | 8.662 | 0.000 | 13.866 | -8.662 | -2.040 | 5.843 | 5.563 |
| 33 | 1.402 | 5.561 | 3.394 | 6.664 | 24.000 | 0.000 | -0.765 | 24.012 | 31.051 | 4.659 | 1.146 | 6.782 |
| 34 | 1.579 | 4.097 | 2.121 | 4.877 | 0.000 | 0.000 | 12.494 | 12.494 | 26.504 | 5.435 | 2.153 | -0.830 |