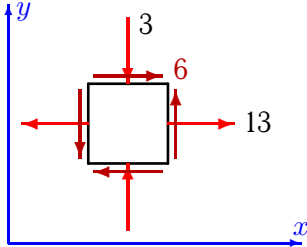


Плоское напряженное состояние

Для напряженного состояния, изображенного на рисунке, вычислить главные (σ_1, σ_3) и максимальные касательные напряжения τ_{\max} ; определить положение площадок, на которые они действуют. Все напряжения даны в МПа.

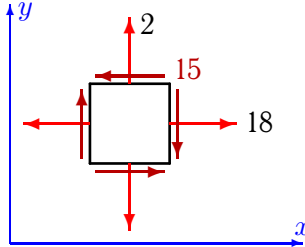
Задача М3.1.

3



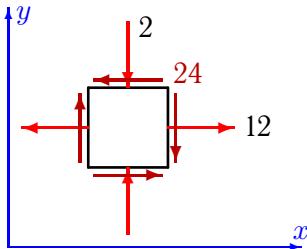
Задача М3.2.

3



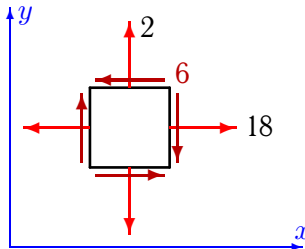
Задача М3.3.

3



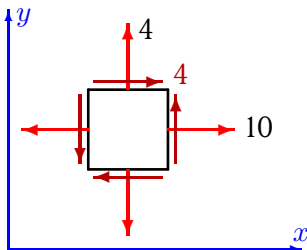
Задача М3.4.

3



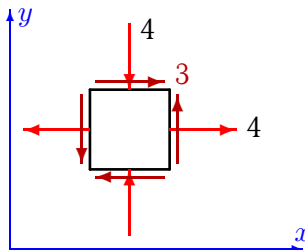
Задача М3.5.

3



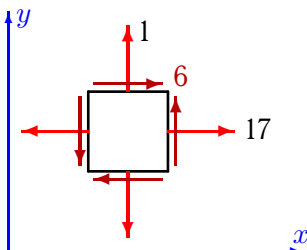
Задача М3.6.

3



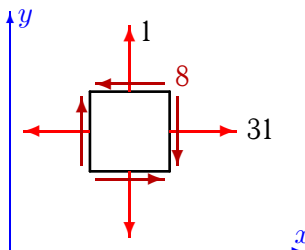
Задача М3.7.

3



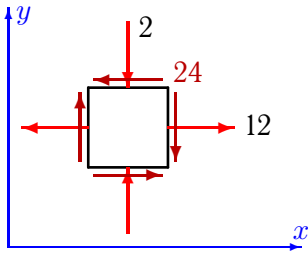
Задача М3.8.

3



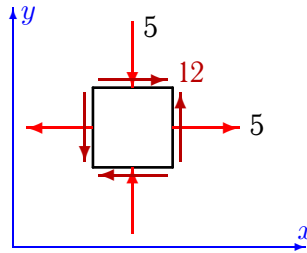
Задача М3.9.

3



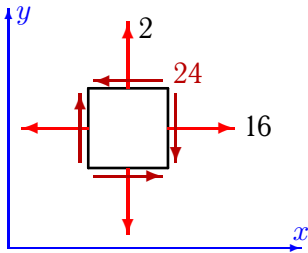
Задача М3.10.

3



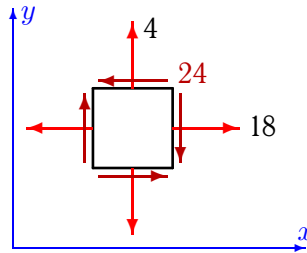
Задача М3.11.

3



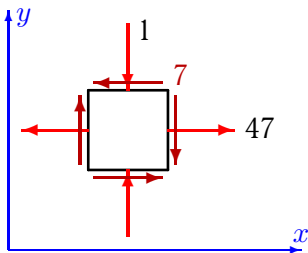
Задача М3.12.

3



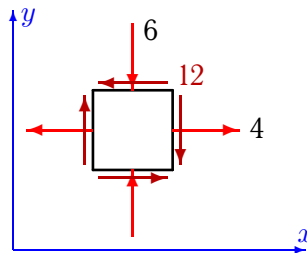
Задача М3.13.

3



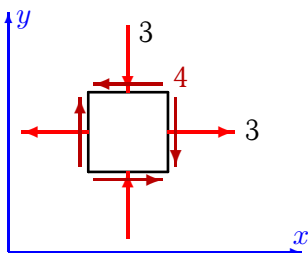
Задача М3.14.

3



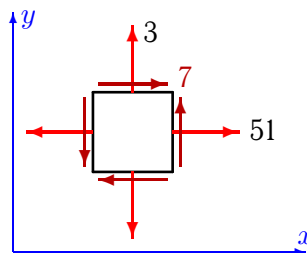
Задача М3.15.

3



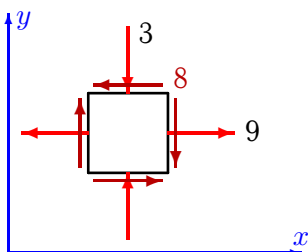
Задача М3.16.

3



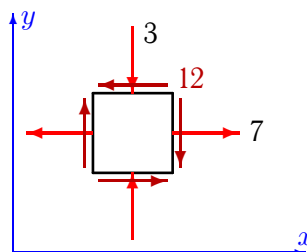
Задача М3.17.

3



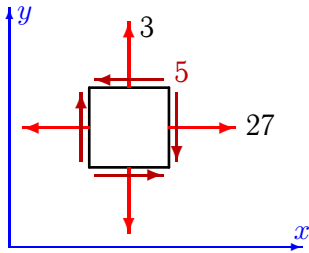
Задача М3.18.

3



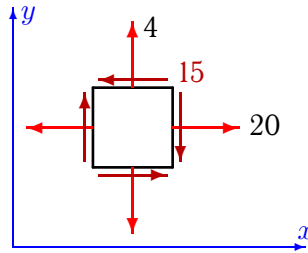
Задача М3.19.

3



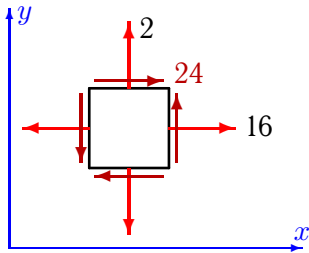
Задача М3.20.

3



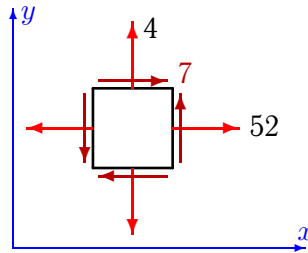
Задача М3.21.

3



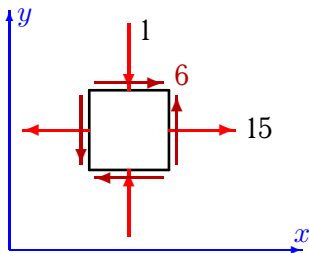
Задача М3.22.

3



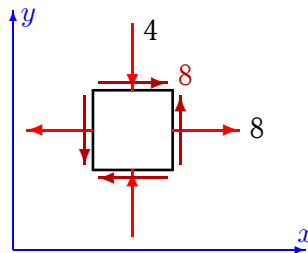
Задача М3.23.

3



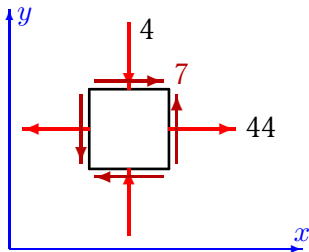
Задача М3.24.

3



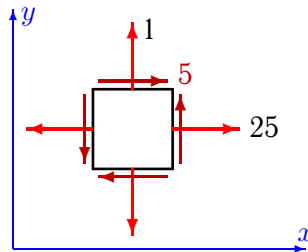
Задача М3.25.

3



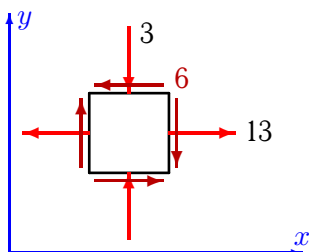
Задача М3.26.

3



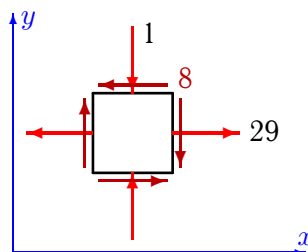
Задача М3.27.

3



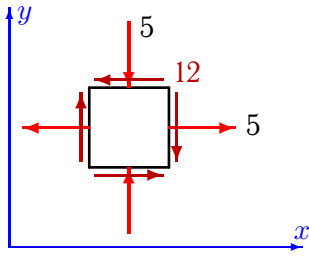
Задача М3.28.

3



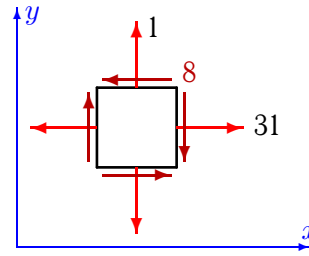
Задача М3.29.

3



Задача М3.30.

3



М3 Ответы.
Плоское напряженное состояние

04.04.2012

| № | σ_x | σ_y | τ_{xy} | σ_1 | σ_3 | τ_{\max} | J_1 | J_2 | $\operatorname{tg} 2\alpha$ |
|----|------------|------------|-------------|------------|------------|---------------|-------|-------|-----------------------------|
| 1 | 13 | -3 | 6 | 15 | -5 | 10 | 10 | -75 | -3/4 |
| 2 | 18 | 2 | -15 | 27 | -7 | 17 | 20 | -189 | 15/8 |
| 3 | 12 | -2 | -24 | 30 | -20 | 25 | 10 | -600 | 24/7 |
| 4 | 18 | 2 | -6 | 20 | 0 | 10 | 20 | 0 | 3/4 |
| 5 | 10 | 4 | 4 | 12 | 2 | 5 | 14 | 24 | -4/3 |
| 6 | 4 | -4 | 3 | 5 | -5 | 5 | 0 | -25 | -3/4 |
| 7 | 17 | 1 | 6 | 19 | -1 | 10 | 18 | -19 | -3/4 |
| 8 | 31 | 1 | -8 | 33 | -1 | 17 | 32 | -33 | 8/15 |
| 9 | 12 | -2 | -24 | 30 | -20 | 25 | 10 | -600 | 24/7 |
| 10 | 5 | -5 | 12 | 13 | -13 | 13 | 0 | -169 | -12/5 |
| 11 | 16 | 2 | -24 | 34 | -16 | 25 | 18 | -544 | 24/7 |
| 12 | 18 | 4 | -24 | 36 | -14 | 25 | 22 | -504 | 24/7 |
| 13 | 47 | -1 | -7 | 48 | -2 | 25 | 46 | -96 | 7/24 |
| 14 | 4 | -6 | -12 | 12 | -14 | 13 | -2 | -168 | 12/5 |
| 15 | 3 | -3 | -4 | 5 | -5 | 5 | 0 | -25 | 4/3 |
| 16 | 51 | 3 | 7 | 52 | 2 | 25 | 54 | 104 | -7/24 |
| 17 | 9 | -3 | -8 | 13 | -7 | 10 | 6 | -91 | 4/3 |
| 18 | 7 | -3 | -12 | 15 | -11 | 13 | 4 | -165 | 12/5 |
| 19 | 27 | 3 | -5 | 28 | 2 | 13 | 30 | 56 | 5/12 |
| 20 | 20 | 4 | -15 | 29 | -5 | 17 | 24 | -145 | 15/8 |
| 21 | 16 | 2 | 24 | 34 | -16 | 25 | 18 | -544 | -24/7 |
| 22 | 52 | 4 | 7 | 53 | 3 | 25 | 56 | 159 | -7/24 |
| 23 | 15 | -1 | 6 | 17 | -3 | 10 | 14 | -51 | -3/4 |
| 24 | 8 | -4 | 8 | 12 | -8 | 10 | 4 | -96 | -4/3 |
| 25 | 44 | -4 | 7 | 45 | -5 | 25 | 40 | -225 | -7/24 |
| 26 | 25 | 1 | 5 | 26 | 0 | 13 | 26 | 0 | -5/12 |
| 27 | 13 | -3 | -6 | 15 | -5 | 10 | 10 | -75 | 3/4 |
| 28 | 29 | -1 | -8 | 31 | -3 | 17 | 28 | -93 | 8/15 |
| 29 | 5 | -5 | -12 | 13 | -13 | 13 | 0 | -169 | 12/5 |
| 30 | 31 | 1 | -8 | 33 | -1 | 17 | 32 | -33 | 8/15 |