

В ПОМОЩЬ СТАРШЕКЛАССНИКАМ, ПРЕПОДАВАТЕЛЯМ
И АБИТУРИЕНТАМ

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Задачи и упражнения на готовых чертежах

7–9 классы
ГЕОМЕТРИЯ

ИЛЕКСА
Москва
2007

Таблица 9.1. Подобные треугольники

Дано: $\triangle ABC \sim \triangle A_1B_1C_1$. Найдите x, y, z .

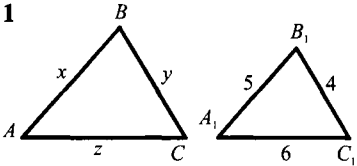
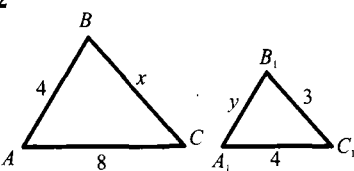
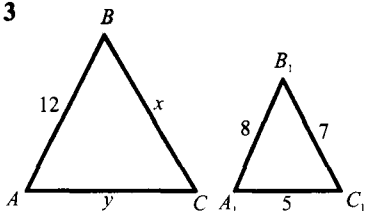
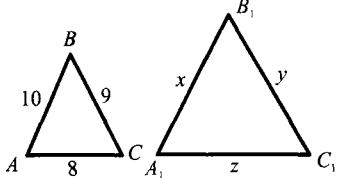
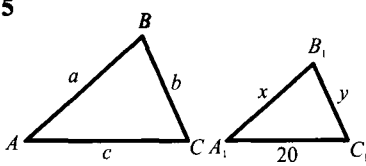
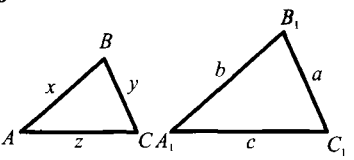
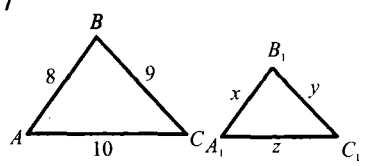
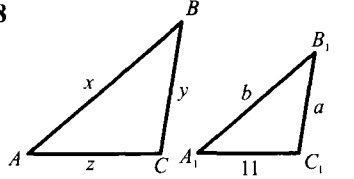
<p>1</p>  <p>Дано: $\frac{BC}{B_1C_1} = 3$.</p>	<p>2</p> 
<p>3</p> 	<p>4</p>  <p>Дано: $P_{A_1B_1C_1} = 54$.</p>
<p>5</p>  <p>Дано: $a : b : c = 4 : 3 : 5$.</p>	<p>6</p>  <p>Дано: $a : b : c = 5 : 6 : 7$. $P_{ABC} = 108$.</p>
<p>7</p>  <p>Дано: $P_{A_1B_1C_1} = 9$.</p>	<p>8</p>  <p>$P_{ABC} = 39$, $P_{A_1B_1C_1} = 26$, $a : b = 2 : 3$.</p>

Таблица 9.2. Первый признак подобия треугольников

Указать подобные треугольники, доказать их подобие.

<p>1</p>	<p>2</p>	<p>3</p>
<p>4</p> <p>Дано: $AB = BC$.</p>	<p>5</p>	<p>6</p>
<p>7</p> <p>Дано: $PEMD$ — трапеция.</p>	<p>8</p>	<p>9</p>
<p>10</p> <p>Дано: $ABCD$ — параллелограмм.</p>	<p>11</p>	<p>12</p> <p>Дано: $APFC$ — параллелограмм.</p>
<p>13</p>	<p>14</p>	<p>15</p> <p>Дано: $ABCD$ — трапеция.</p>

Таблица 9.3. Второй и третий признаки подобия треугольников

Указать подобные треугольники, доказать их подобие.

<p>1</p> <p> $\triangle ABC$ (AB=8, BC=10, $\angle B=35^\circ$) $\triangle PMK$ (PM=4, PK=5, $\angle P=35^\circ$) </p>	<p>2</p> <p> $\triangle ABC$ ($\angle B=25^\circ$) $\triangle FNE$ ($\angle N=25^\circ$, FN=NE) </p>	<p>3</p> <p> $\triangle PME$ (PM=32, ME=24, PE=40) $\triangle FDN$ (FD=4, FN=3, DN=5) </p>
<p>4</p> <p> $\triangle ABC$ (AB=12, BC=8, AC=18) $\triangle ADC$ (AD=27, DC=12, AC=18) </p>	<p>5</p> <p> $\triangle ABC$ (AB=12, AC=16) $\triangle ABD$ (AB=12, AD=7) </p>	<p>6</p> <p> $\triangle ABC$ (AB=8, BC=4, AC=16) $\triangle BCD$ (BC=4, CD=12, BD=4) </p>
<p>7</p> <p> $\triangle ABC$ (AB=16, BC=18, BD=12) $\triangle ABD$ (AB=16, BD=12) $\triangle BDC$ (BC=18, BD=12) </p> <p>Дано: $AC = 24$.</p>	<p>8</p> <p> $\triangle ABC$ (AB=20, BC=36, AC=19) $\triangle ABD$ (AB=20, AD=9, DB=18) $\triangle BDC$ (BC=36, DC=10, DB=18) </p>	<p>9</p> <p>Дано: $AB \cdot BK = CB \cdot BP$.</p>
Доказать, что $\triangle ABC \sim \triangle A_1B_1C_1$, и найти коэффициенты подобия:		
<p>10</p> <p> $\triangle ABC$ $\triangle A_1B_1C_1$ </p>	<p>11</p> <p> $\triangle ABC$ $\triangle A_1B_1C_1$ </p>	<p>12</p> <p> $\triangle ABC$ $\triangle A_1B_1C_1$ </p>

Таблица 9.4. Вписанные углы

Найти x, y (O — центр окружности).

<p>1</p>	<p>2</p>	<p>3</p>
<p>4</p>	<p>5</p>	<p>6</p>
<p>7</p>	<p>8</p>	<p>9</p>
<p>10</p>	<p>11</p>	<p>12</p>

Таблица 9.5. Вписанные углы. Угол между касательной и хордой

O — центр окружности, B — точка касания.

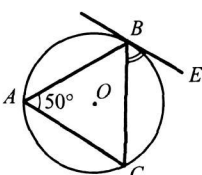
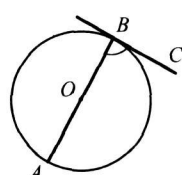
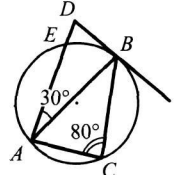
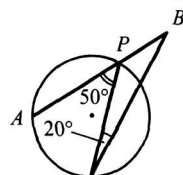
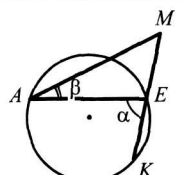
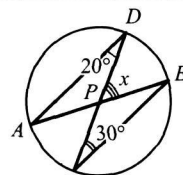
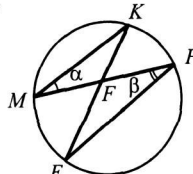
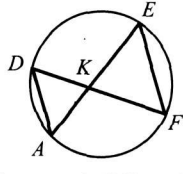
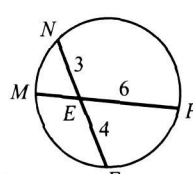
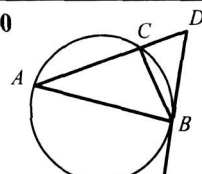
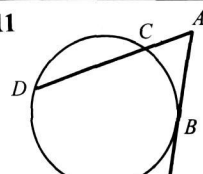
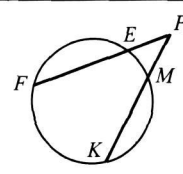
<p>1</p>  <p>Найти: $\angle CBE$.</p>	<p>2</p>  <p>Найти: $\angle ABC$.</p>	<p>3</p>  <p>Найти: $\angle ADB$.</p>
<p>4</p>  <p>Найти: $\angle ABE$.</p>	<p>5</p>  <p>Найти: $\angle AMK$.</p>	<p>6</p>  <p>Найти: x.</p>
<p>7</p>  <p>Найти: $\angle KFP$.</p>	<p>8</p>  <p>Доказать: $\triangle ADK \sim \triangle FEK$, $AK \cdot KE = DK \cdot KF$.</p>	<p>9</p>  <p>Найти: ME.</p>
<p>10</p>  <p>Доказать: $\triangle ABD \sim \triangle CBD$.</p>	<p>11</p>  <p>Доказать: $AB^2 = AD \cdot AC$.</p>	<p>12</p>  <p>Доказать: $PE \cdot PF = PM \cdot PK$.</p>

Таблица 9.6. Решение треугольников

Найти x :

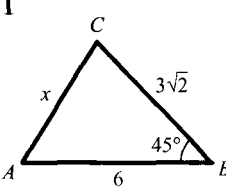
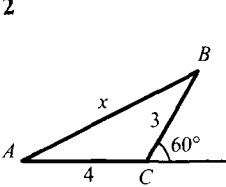
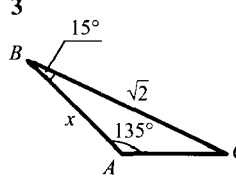
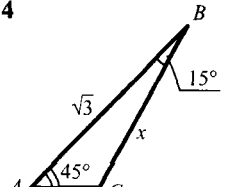
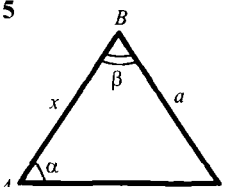
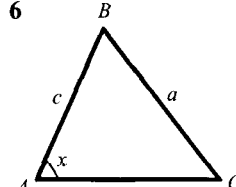
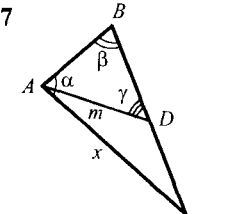
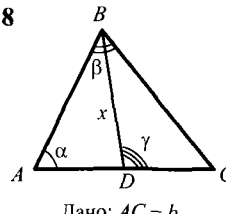
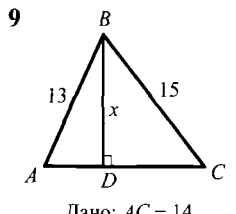
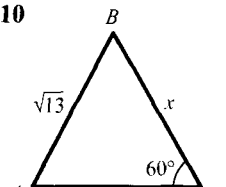
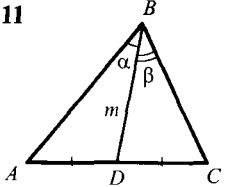
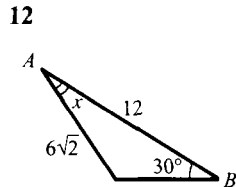
<p>1</p> 	<p>2</p> 	<p>3</p> 
<p>4</p> 	<p>5</p> 	<p>6</p> 
<p>7</p> 	<p>8</p>  <p>Дано: $AC = b$.</p>	<p>9</p>  <p>Дано: $AC = 14$.</p>
<p>10</p> 	<p>11</p>  <p>Найти: AC.</p>	<p>12</p> 

Таблица 9.7. Решение треугольников

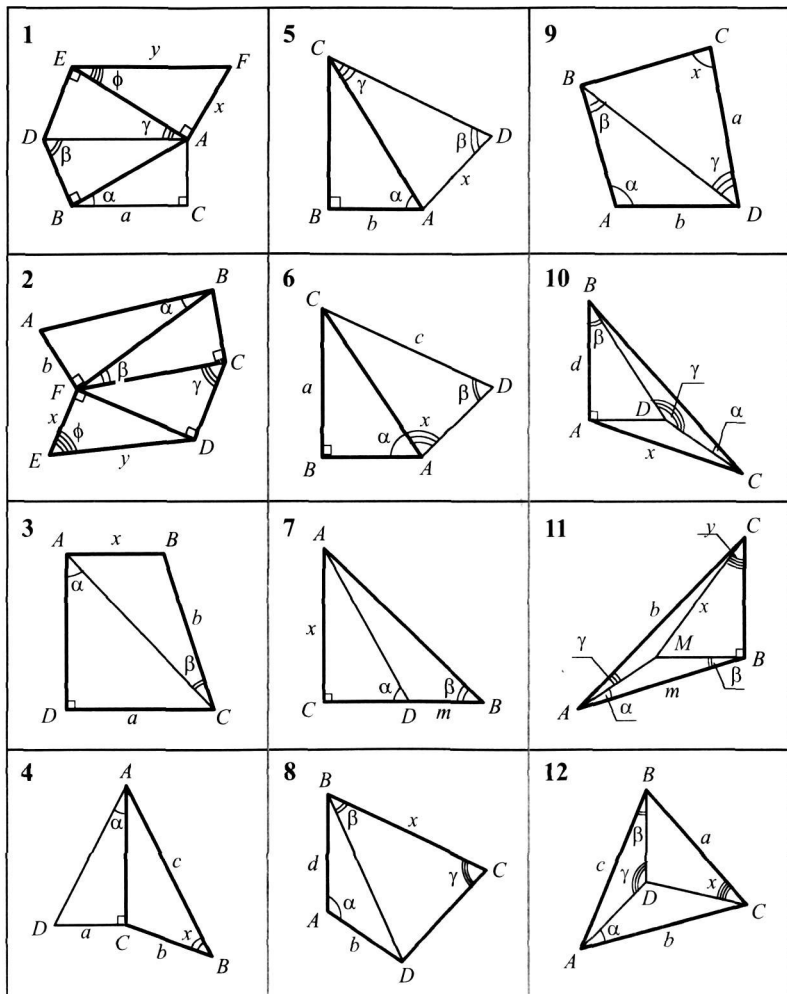
Найти x и y :

Таблица 9.8. Правильные многоугольники

a — сторона правильного многоугольника, $R(r)$ — радиус описанной (вписанной) окружности, O — центр правильного многоугольника.

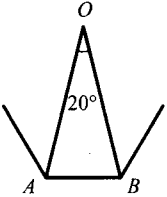
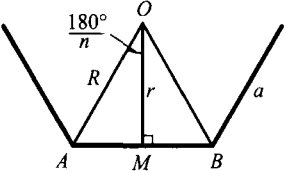
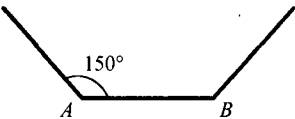
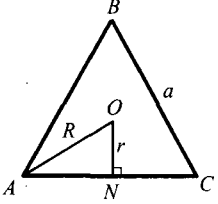
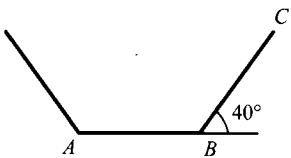
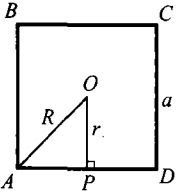
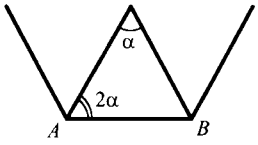
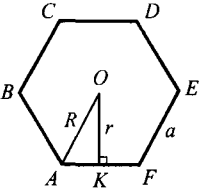
Найти количество сторон правильного многоугольника	Зная один из элементов (a , R или r), найти два других
<p>1</p> 	<p>5</p> 
<p>2</p> 	<p>6</p> 
<p>3</p> 	<p>7</p> 
<p>4</p> 	<p>8</p> 

Таблица 9.9. Площадь треугольника

O — центр окружности. Найти площадь $\triangle ABC$.

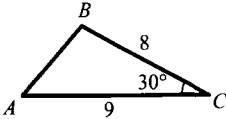
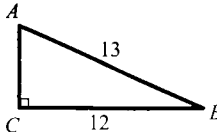
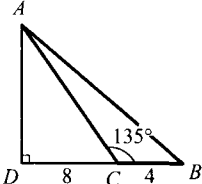
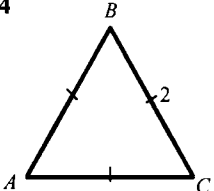
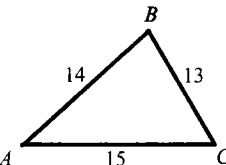
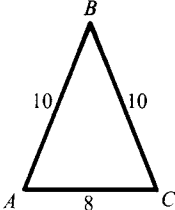
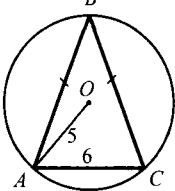
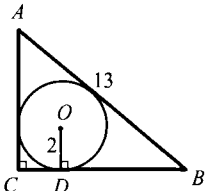
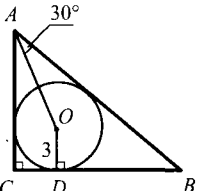
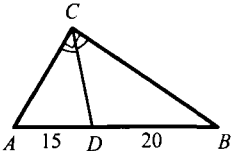
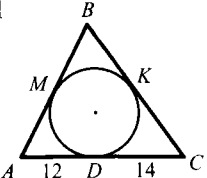
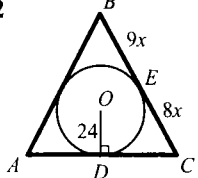
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<p>4</p> 	<p>5</p> 	<p>6</p> 
<p>7</p> 	<p>8</p> 	<p>9</p> 
<p>10</p> 	<p>11</p>  <p>Дано: $P = 84$.</p>	<p>12</p>  <p>Дано: $\angle A = \angle C$.</p>

Таблица 9.10. Площадь четырехугольника

Найти площадь четырехугольника $ABCD$:

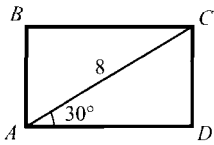
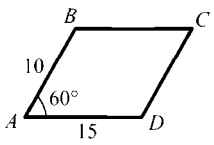
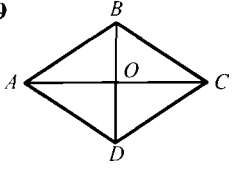
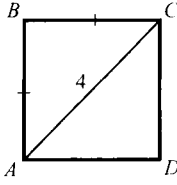
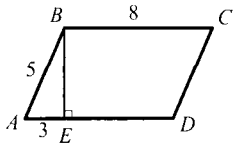
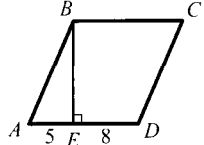
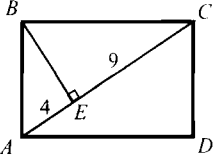
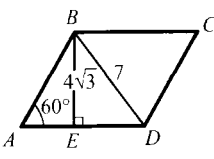
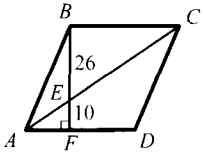
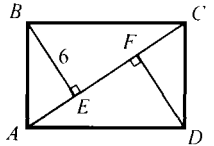
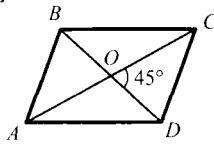
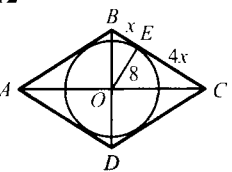
$ABCD$ — прямоугольник	$ABCD$ — параллелограмм	$ABCD$ — ромб
<p>1</p> 	<p>5</p> 	<p>9</p>  <p>Дано: $AC = 8, BD = 5$.</p>
<p>2</p> 	<p>6</p> 	<p>10</p> 
<p>3</p> 	<p>7</p> 	<p>11</p> 
<p>4</p>  <p>Дано: $EF = 16$.</p>	<p>8</p>  <p>Дано: $AC = 8, BD = 6$.</p>	<p>12</p> 

Таблица 9.11. Площадь четырехугольника

Найти площадь трапеции $ABCD$:

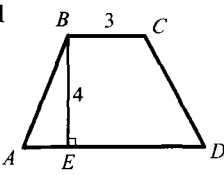
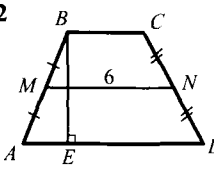
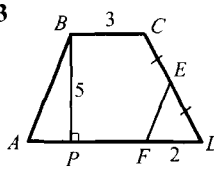
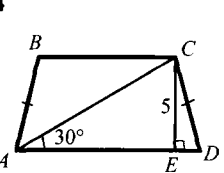
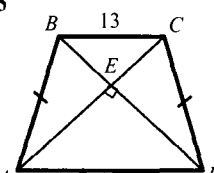
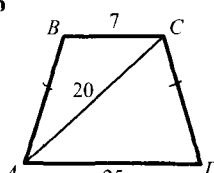
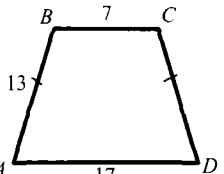
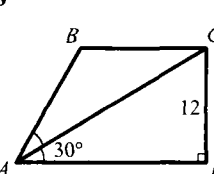
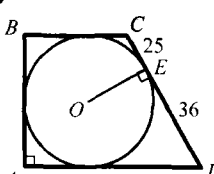
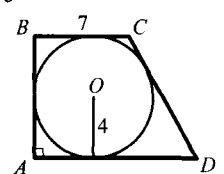
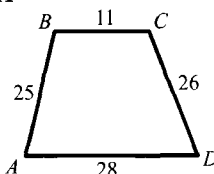
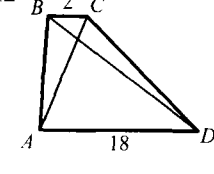
<p>1</p>  <p>Дано: $AD = 7$.</p>	<p>2</p>  <p>Дано: $BE = 5$.</p>	<p>3</p>  <p>Дано: $AB \parallel FE$.</p>
<p>4</p> 	<p>5</p> 	<p>6</p> 
<p>7</p> 	<p>8</p> 	<p>9</p> 
<p>10</p> 	<p>11</p> 	<p>12</p>  <p>Дано: $AC = 7$, $BD = 15$.</p>

Таблица 9.12. Площади фигур

Найти отношение площадей $\frac{S_1}{S_2}$:

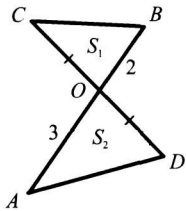
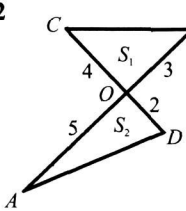
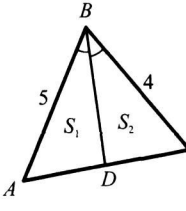
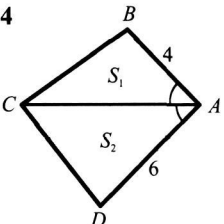
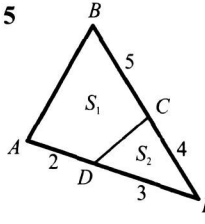
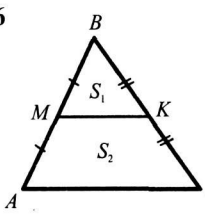
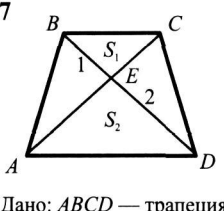
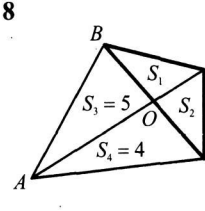
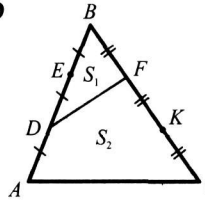
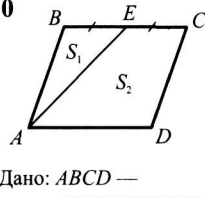
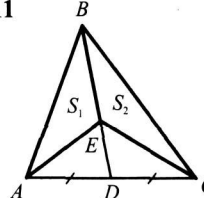
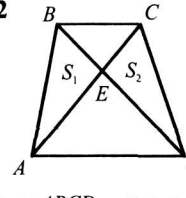
<p>1</p> 	<p>2</p> 	<p>3</p> 
<p>4</p> 	<p>5</p> 	<p>6</p> 
<p>7</p>  <p>Дано: $ABCD$ — трапеция.</p>	<p>8</p> 	<p>9</p> 
<p>10</p>  <p>Дано: $ABCD$ — параллелограмм.</p>	<p>11</p> 	<p>12</p>  <p>Дано: $ABCD$ — трапеция.</p>

Таблица 9.13. Площади фигур

Найти площадь x :

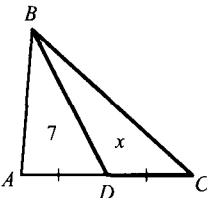
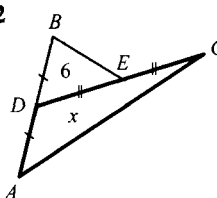
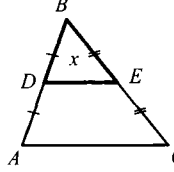
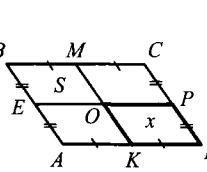
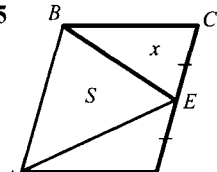
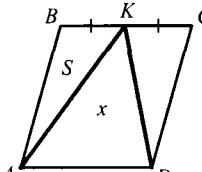
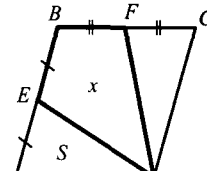
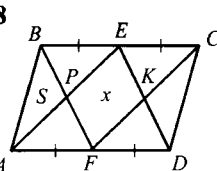
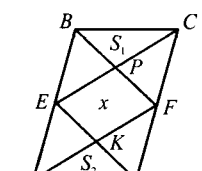
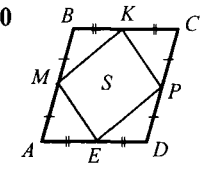
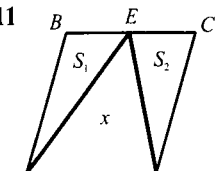
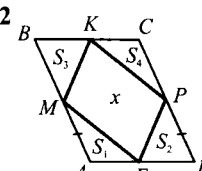
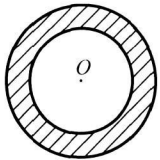
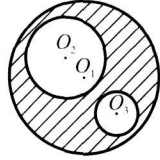
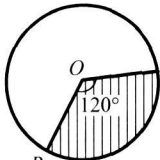
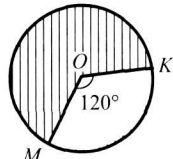
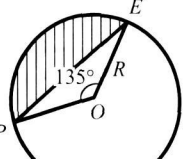
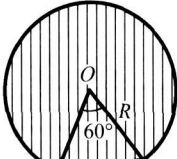
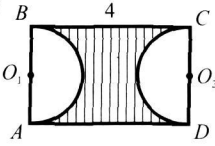
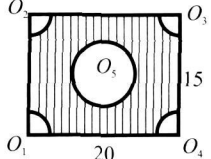
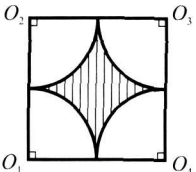
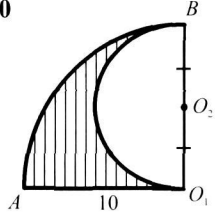
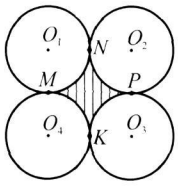
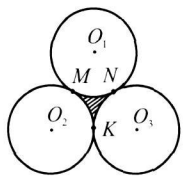
<p>1</p> 	<p>2</p> 	<p>3</p>  <p>Дано: $S_{\triangle ABC} = 8$.</p>
Дано: $ABCD$ — параллелограмм		
<p>4</p> 	<p>5</p> 	<p>6</p> 
<p>7</p> 	<p>8</p> 	<p>9</p> 
<p>10</p>  <p>Найти: S_{ABCD}.</p>	<p>11</p> 	<p>12</p> 

Таблица 9.14. Площадь круга и его частей

R — радиус круга, O — центр. Найти площадь заштрихованной фигуры.

<p>1</p>  <p>Дано: $R_1 = 5, R_2 = 3$.</p>	<p>2</p>  <p>Дано: $R_1 = 10, R_2 = 6, R_3 = 2$.</p>	<p>3</p>  <p>Дано: $R = 3$.</p>
<p>4</p>  <p>Дано: $R = 6$.</p>	<p>5</p> 	<p>6</p> 
<p>7</p>  <p>Дано: $ABCD$ — прямоугольник, $R_1 = R_2 = 1$.</p>	<p>8</p>  <p>Дано: $R_1 = R_2 = R_3 = R_4 = 2, R_5 = 3$.</p>	<p>9</p>  <p>Дано: $R_1 = R_2 = R_3 = R_4 = 4$.</p>
<p>10</p> 	<p>11</p>  <p>Дано: $R_1 = R_2 = R_3 = R_4 = 2$.</p>	<p>12</p>  <p>Дано: $R_1 = R_2 = R_3 = 4$.</p>