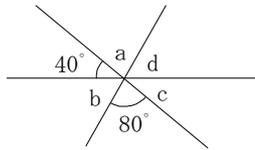


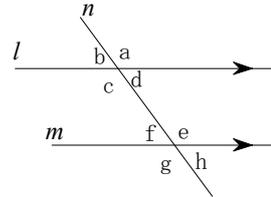
図形……平行と合同

§1 平行線と角

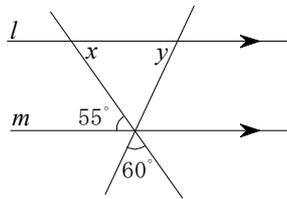
1. $\angle a = 80^\circ$ $\angle b = \angle d = 60^\circ$
 $\angle c = 40^\circ$



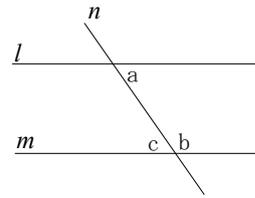
2. $\angle b = \angle d = \angle f = \angle h = 110^\circ$
 $\angle c = \angle e = \angle g = 130^\circ$



3. $\angle x = 55^\circ$ $\angle y = 70^\circ$

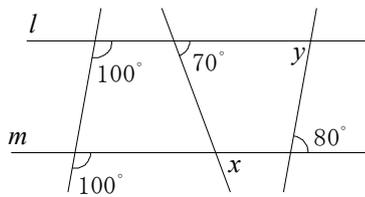


4. $l \parallel m$ だから, $\angle a = \angle c$ (錯角),
 したがって,
 $\angle a + \angle b = \angle c + \angle b = 180^\circ$

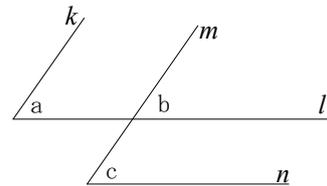


練習

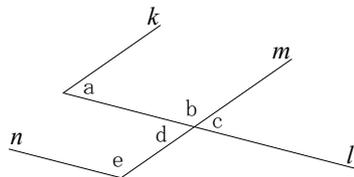
1. 同位角が等しい (100°) から $l \parallel m$
 $\angle x = 70^\circ$ $\angle y = 80^\circ$



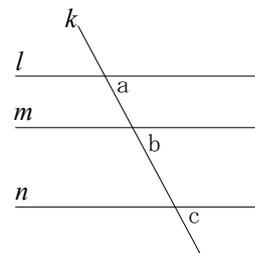
2. $\angle c = 45^\circ$



3. $\angle e = 130^\circ$



4. $l \parallel m$ だから, $\angle a = \angle b$ (同位角)
 $m \parallel n$ だから, $\angle b = \angle c$ (同位角)
 したがって, $\angle a = \angle c$
 よって,
 同位角が等しいので, $l \parallel n$



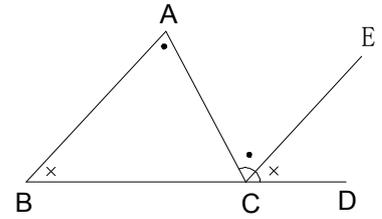
§2 三角形の角

1. 点C を通りAB に平行な直線CE を引く。

$$\angle A = \angle ACE \text{ (錯角)}$$

$$\angle B = \angle ECD \text{ (同位角)}$$

$$\text{よって, } \angle A + \angle B = \angle ACE + \angle ECD = \angle ACD$$



2. (1) $x = 180^\circ - (40^\circ + 75^\circ) = 65^\circ$

(2) $x = 50^\circ + 20^\circ = 70^\circ$

(3) $x = 110^\circ - 60^\circ = 50^\circ$

3. ありません。(三角形の内角の和が 180° を超えてしまう)

4. (1) 鋭角三角形 (2) 直角三角形 (3) 鋭角三角形
 (4) 鈍角三角形 (5) 直角三角形 (6) 鈍角三角形

5. 90°

6. $180(10 - 2) = 1440^\circ$ 1つの内角の大きさは $\frac{1440}{10} = 144^\circ$

7. (1) $180(n - 2) = 900$ より, $n = 7$ 角形
 (2) $180(n - 2) = 1800$ より, $n = 12$ 角形

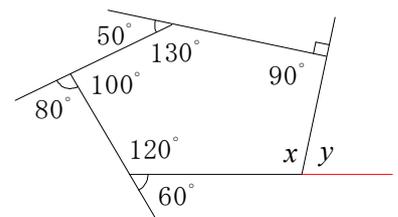
8. 1つの外角 $= \frac{360^\circ}{10} = 36^\circ$ 1つの内角 $= \frac{180^\circ(10 - 2)}{10} = 144^\circ$
 または, $180^\circ - 36^\circ = 144^\circ$

9. 五角形の内角の和は, $180^\circ(5 - 2) = 540^\circ$

$$x = 540 - (90 + 130 + 100 + 120) = 100^\circ$$

$$\text{または, } y = 360 - (90 + 50 + 80 + 60) = 80^\circ$$

$$\text{よって, } x = 180^\circ - y = 180^\circ - 80^\circ = 100^\circ$$



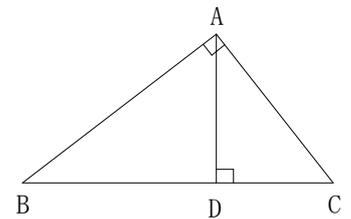
練習

1. 頂点Cにおける外角 $> \angle A$
 頂点Cにおける外角 $> \angle B$ (頂点Cにおける外角 = $\angle A + \angle B$ だら)

2. (1) $x + 40 = 60 + 50$ より, $x = 70^\circ$
 (2) $x = 360 - (60 + 90 + 40 + 100) = 70^\circ$
 (3) $x = 30 + 80 + 20 = 130^\circ$

3. $a + b + c + d + e + f = 360^\circ$

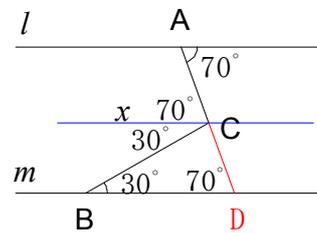
4. $\angle B + \angle BAD = 90^\circ$ $\angle C = \angle BAD$
 $\angle CAD + \angle BAD = 90^\circ$
 したがって, $\angle B = \angle CAD$



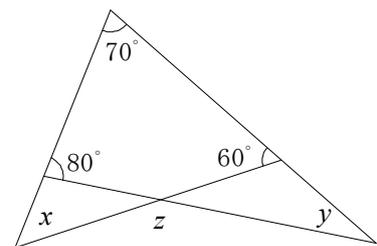
§3 三角形の合同

問題

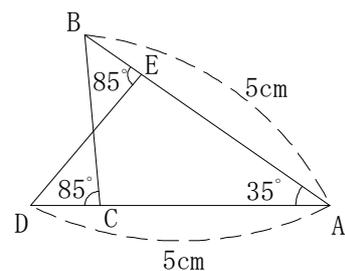
1. (ア) $x = 70 + 30 = 100^\circ$
 (イ) x は $\triangle BCD$ の外角だから,
 $x = 70 + 30 = 100^\circ$



2. $x = 180 - (70 + 60) = 50^\circ$
 $y = 180 - (70 + 80) = 30^\circ$
 $z = 360 - (70 + 80 + 60) = 150^\circ$



3. 1辺と両端の角がそれぞれ等しい。



4. (1) いえる (2) いえない (3) いえない

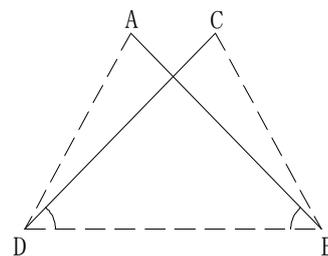
図形……図形と証明

§1 証明

§2 証明のしくみ

§3 合同条件と証明の進め方

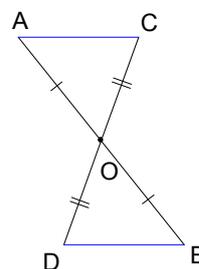
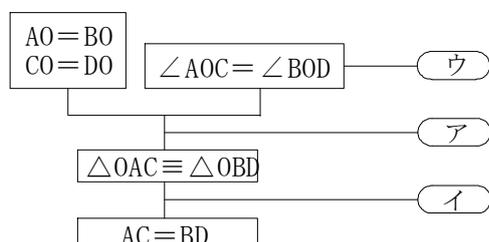
1. (1) $\triangle ABD$ と $\triangle CDB$
- (2) $AB=CD$, $BD=DB$ (共通), $\angle ABD=\angle CDB$
- (3) 2辺とその間の角がそれぞれ等しい



問題

1.

$\triangle OAC$ と $\triangle OBD$ で,



2. $\triangle PAB$ と $\triangle PBC$ において,

$AC=BC$ ①

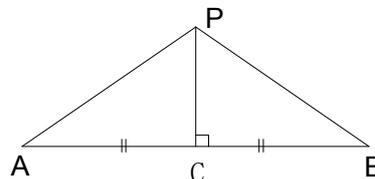
$PC=PC$ (共通) ②

$\angle PCA=\angle PCB=90^\circ$ ③

①, ②, ③ より
2辺とその間の角がそれぞれ等しいので

$\triangle PAB \equiv \triangle PBC$

よって, $PA=PB$



3. (ア) $\angle b + \angle d = \angle AJF$

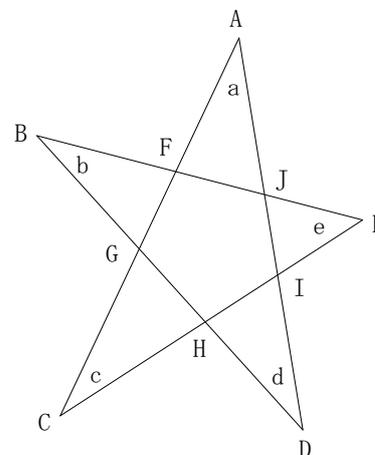
$\angle c + \angle e = \angle AFJ$

$\angle a + \angle b + \angle c + \angle d + \angle e$
 $= \angle a + \angle AJF + \angle AFJ = 180^\circ$

(イ) $\angle a + \angle c = \angle HID$

$\angle BHE = \angle HID + \angle d = \angle a + \angle c + \angle d$

$\angle a + \angle b + \angle c + \angle d + \angle e$
 $= \angle BHE + \angle b + \angle e = 180^\circ$



以上