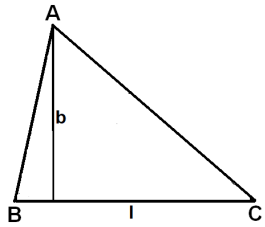
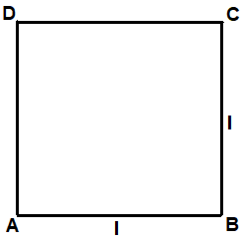
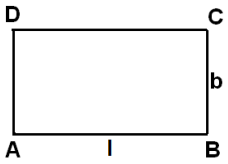
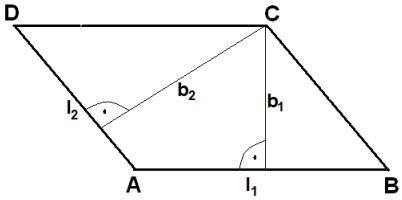
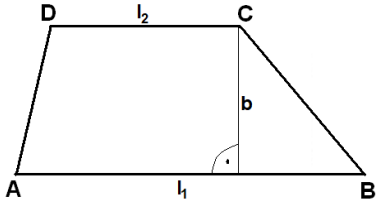
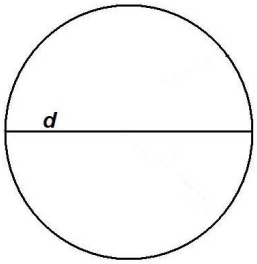
Michael Buhlmann

Mathematik-Aufgabenpool
> Flächenberechnungen von geometrischen Figuren Ia

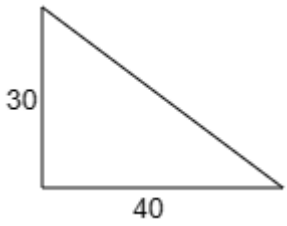
Einleitung: Dreieck, Trapez, Parallelogramm, Quadrat, Rechteck, Kreis usw. nennt man geometrische Figuren. Sie haben einen Flächeninhalt A, der mit Hilfe von Formeln berechnet und bestimmt werden kann. Dies gilt auch für aus Dreieck, Trapez, Parallelogramm, Quadrat, Rechteck, Kreis usw. zusammengesetzten geometrischen Figuren, die dazu entsprechend in Grundfiguren unterteilt werden. Für die Grundfiguren gilt die nachstehende Formelsammlung:

Formelsammlung (Flächeninhalt):

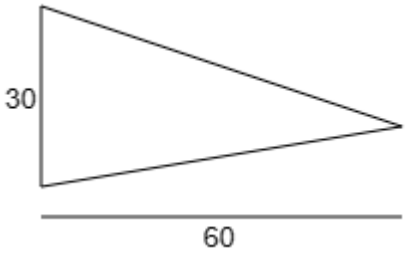
Dreieck	$A = \frac{1}{2} \cdot l \cdot b = \frac{lb}{2}$	
Quadrat	$A = l^2$	
Rechteck	$A = l \cdot b$	
Parallelogramm	$A = l_1 \cdot b_1 = l_2 \cdot b_2$	
Trapez	$A = \frac{l_1 + l_2}{2} \cdot b$	
Kreis	$A = \frac{d^2}{4} \cdot \pi = \frac{1}{4} \cdot d^2 \cdot \pi$	

Aufgabe 1: Berechne den Flächeninhalt der nachstehenden einfachen geometrischen Figuren (A = Flächeninhalt, alle Längen in Millimetern, Ergebnis auch in Quadratzentimetern und Quadratmetern).

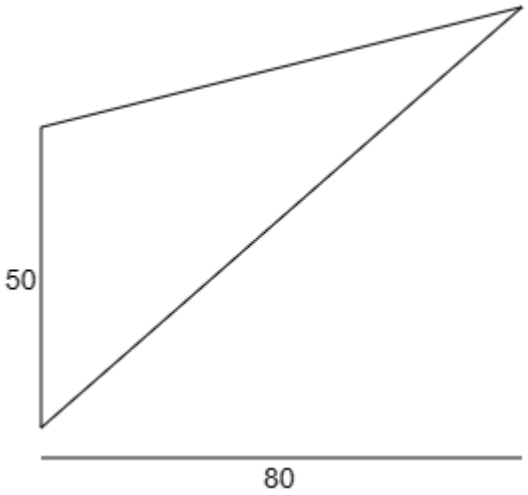
a)



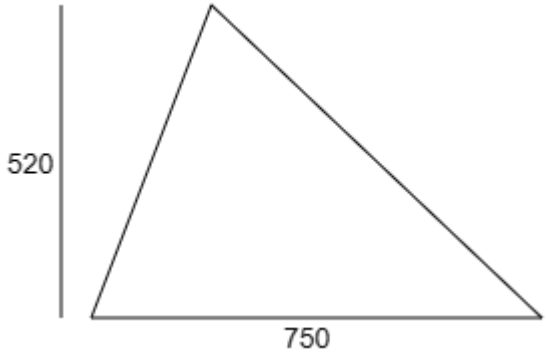
b)



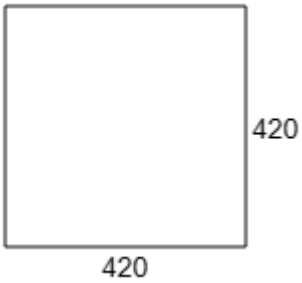
c)



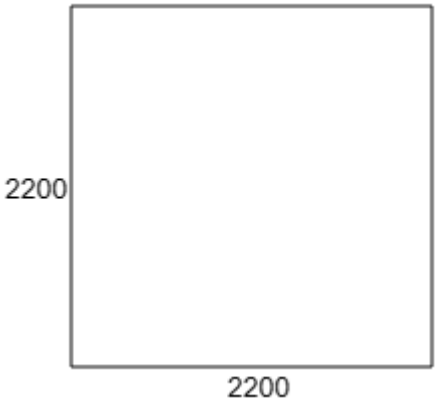
d)



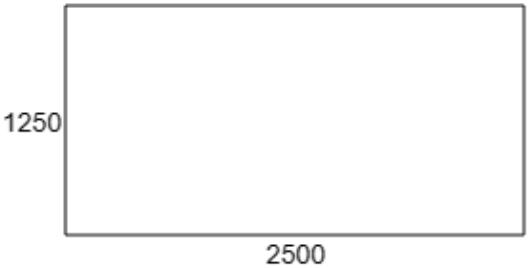
e)



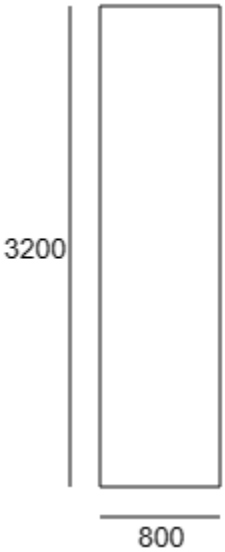
f)



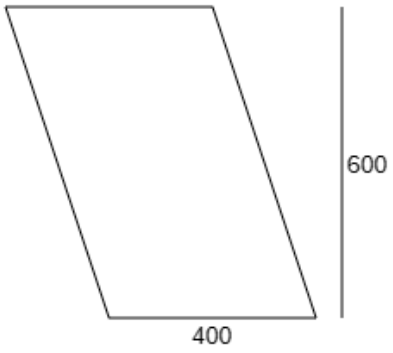
g)



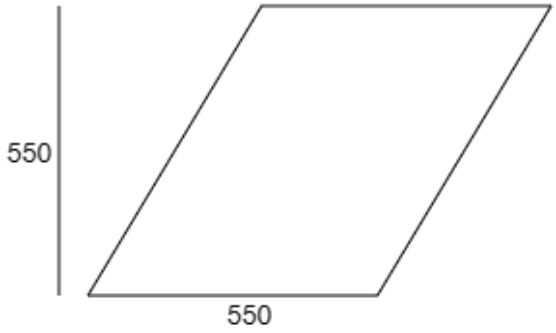
h)



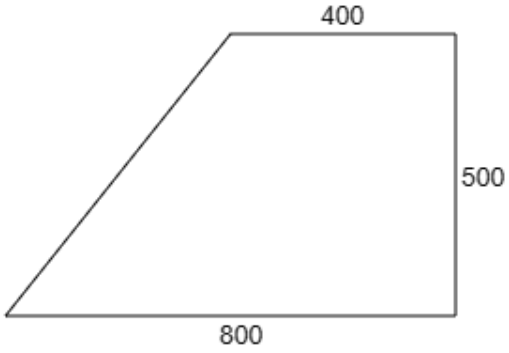
i)


600
400

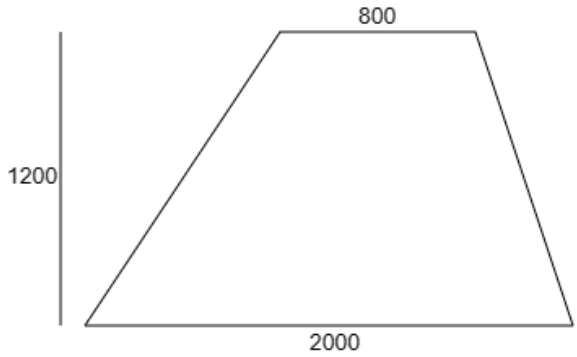
j)


550
550

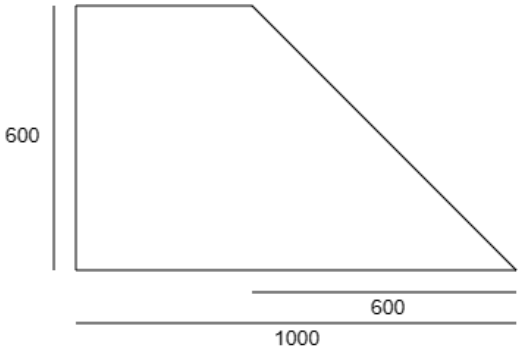
k)


400
500
800

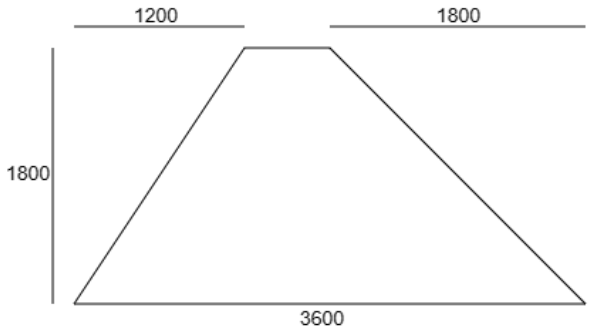
l)


800
1200
2000

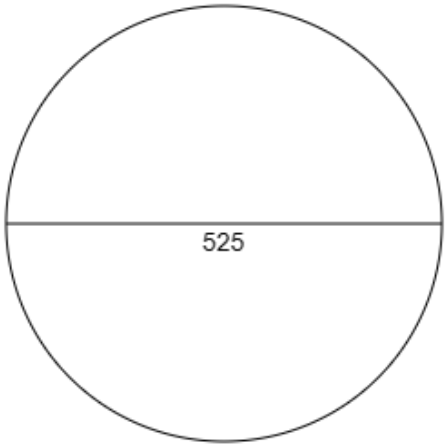
m)


600
600
1000

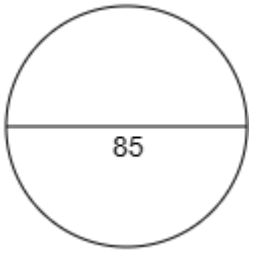
n)


1200
1800
1800
3600

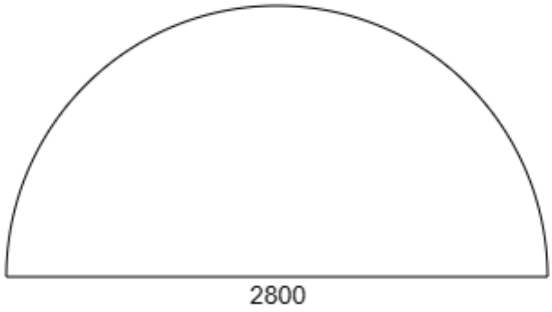
o)


525

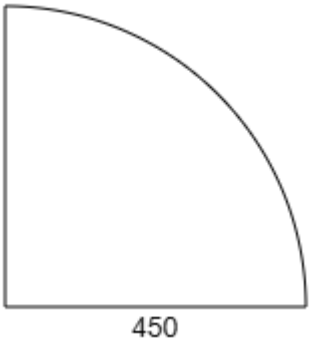
p)


85

q)


2800

r)


450

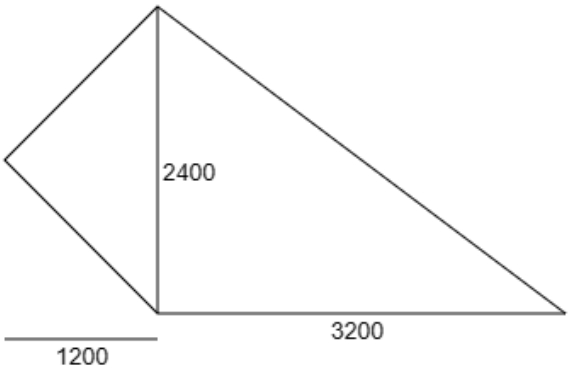
Vorgehensweise: Zur Ermittlung des Flächeninhalts ist die obige Formelsammlung anzuwenden.

Lösungen:

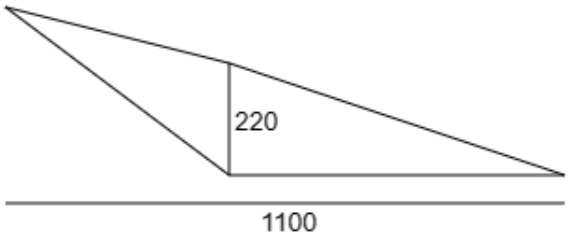
Flächeninhalt A =	mm^2	cm^2	m^2
a)	600	6	0,0006
b)	900	9	0,0009
c)	2000	20	0,002
d)	195000	1950	0,195
e)	176400	1764	0,1764
f)	4840000	48400	4,84
g)	3125000	31250	3,125
h)	2560000	25600	2,56
i)	240000	2400	0,24
j)	302500	3025	0,3025
k)	300000	3000	0,3
l)	1680000	16800	1,68
m)	420000	4200	0,42
n)	3780000	37800	3,78
o)	216475,37	2164,7536	0,21647536
p)	5674,5	56,745	0,0056745
r) (Halbkreis)	3078760,8	30787,608	3,0787608
s) (Viertelkreis: d = 900 mm)	159043,13	1590,4313	0,15904313

Aufgabe 2: Berechne den Flächeninhalt der nachstehenden zusammengesetzten geometrischen Figuren (A = Flächeninhalt, alle Längen in Millimetern, Ergebnis auch in Quadratzentimetern und Quadratmetern).

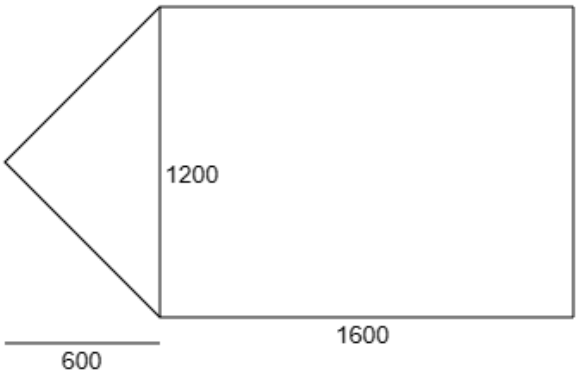
a)



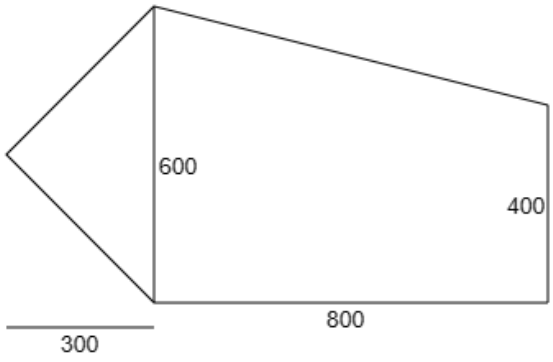
b)



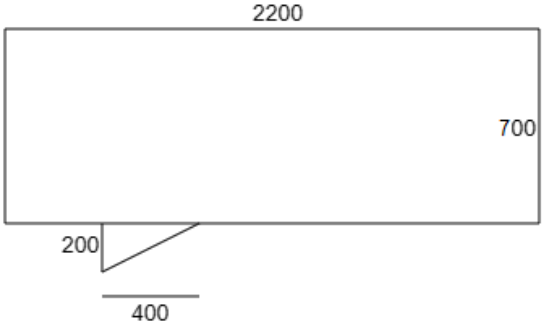
c)



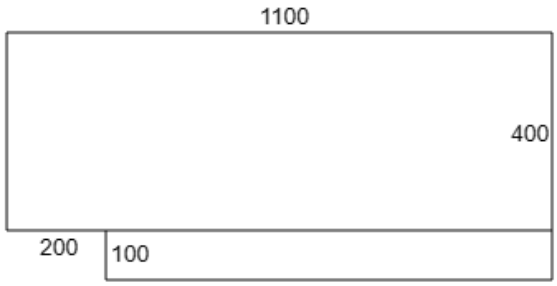
d)



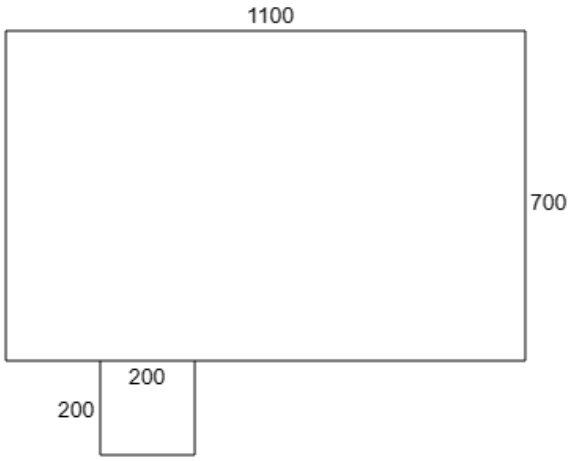
e)



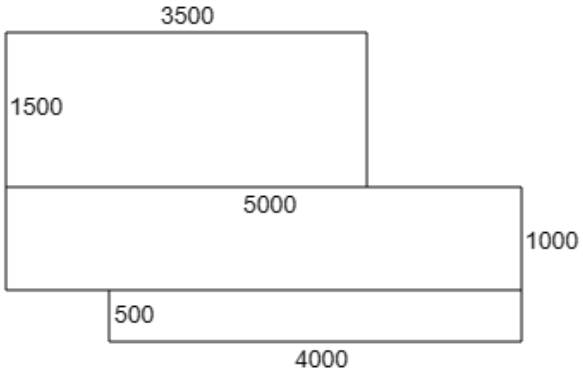
f)



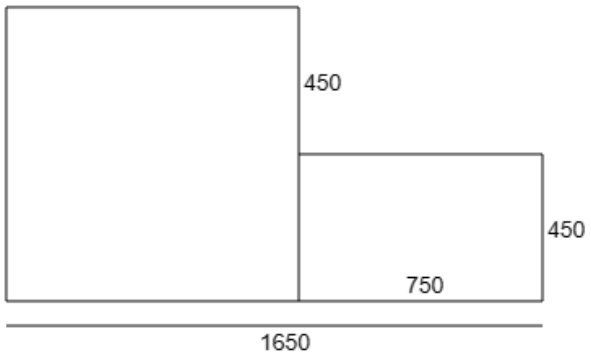
g)


1100
700
200
200

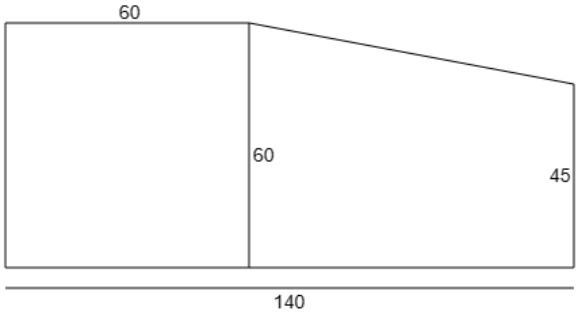
h)


3500
1500
5000
1000
500
4000

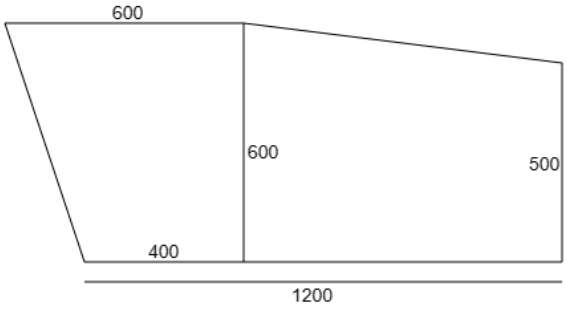
i)


450
450
750
1650

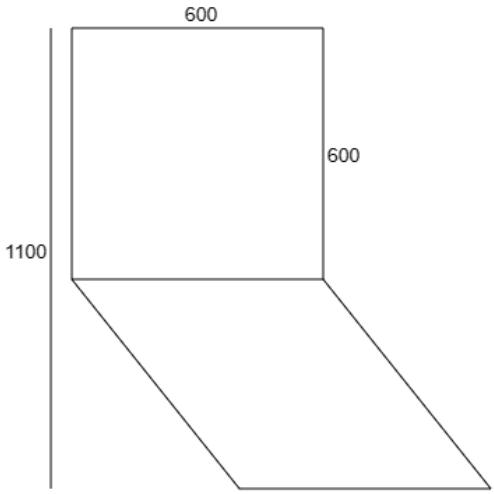
j)


60
60
45
140

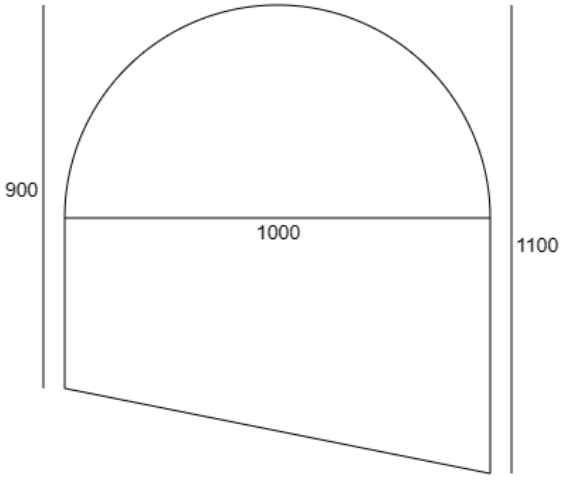
k)


600
600
500
400
1200

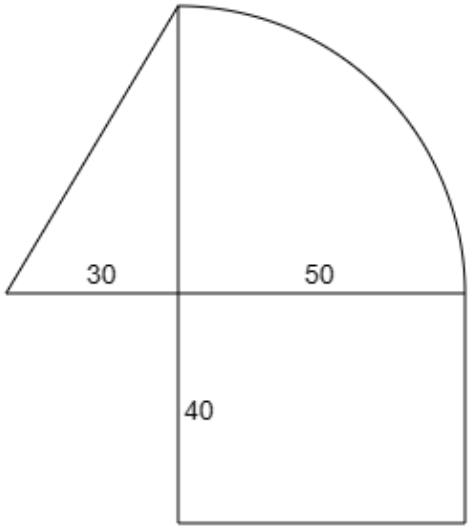
l)


600
600
1100

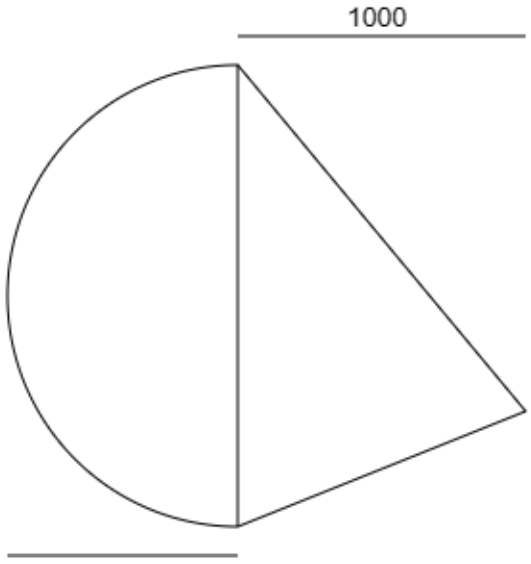
m)


900
1000
1100

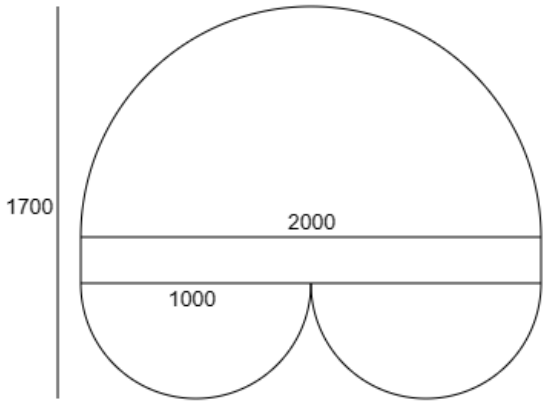
n)


30
50
40

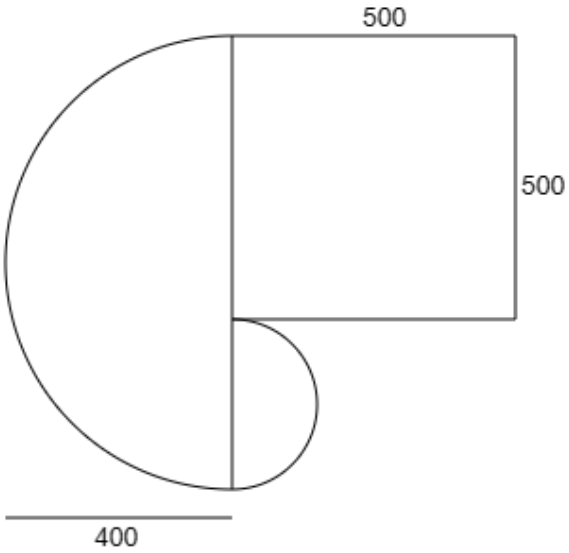
o)



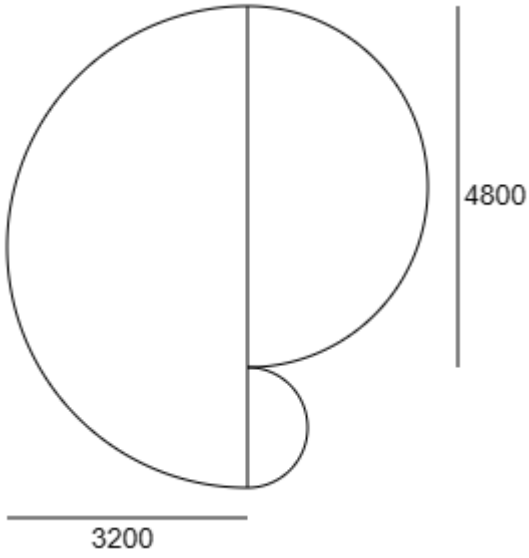
p)



q)



r)



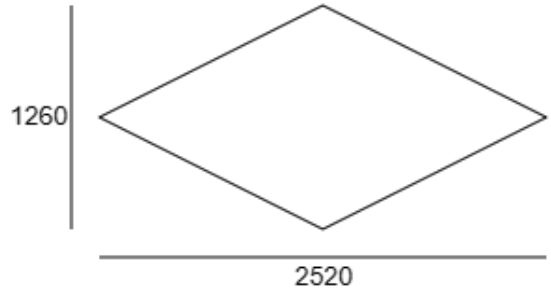
Vorgehensweise: Zur Ermittlung des Flächeninhalts ist für die Teilflächen die obige Formelsammlung anzuwenden, die Teilflächeninhalte sind zusammenzuaddieren.

Lösungen:

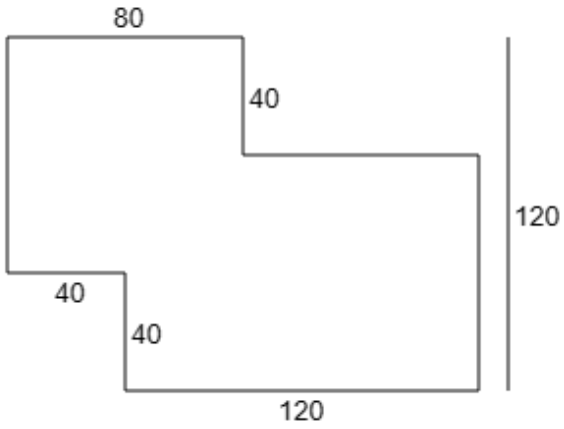
Flächeninhalt A =	mm^2	cm^2	m^2
a)	5280000	52800	5,28
b)	121000	1210	0,121
c)	2280000	22800	2,28
d)	490000	4900	0,49
e)	1580000	15800	1,58
f)	530000	5300	0,53
g)	810000	8100	0,81
h)	12250000	122500	12,25
i)	1147500	11475	1,1475
j)	7800	78	0,0078
k)	740000	7400	0,74
l)	660000	6600	0,66
m)	1285398,16	12853,9816	1,28539816
n)	4713,5	47,135	0,0047135
o)	1805309,65	18053,0965	1,80530965
p)	2756194,5	27561,945	2,7561945
q)	536670,33	5366,7033	0,53667033
r)	26138050,88	261380,5088	26,13805088

Aufgabe 3: Berechne den Flächeninhalt der nachstehenden zusammengesetzten geometrischen Figuren (A = Flächeninhalt, alle Längen in Millimetern, Ergebnis auch in Quadratzentimetern und Quadratmetern).

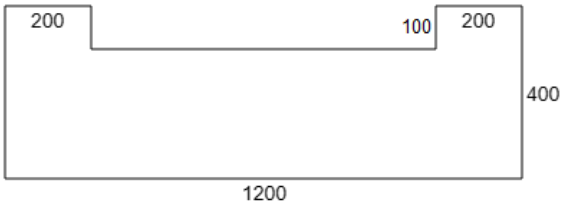
a)



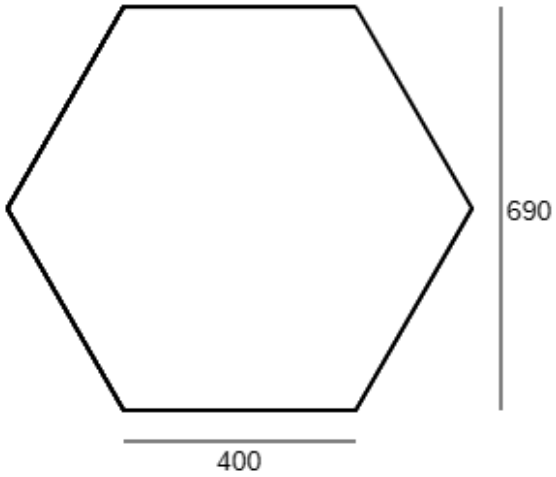
b)



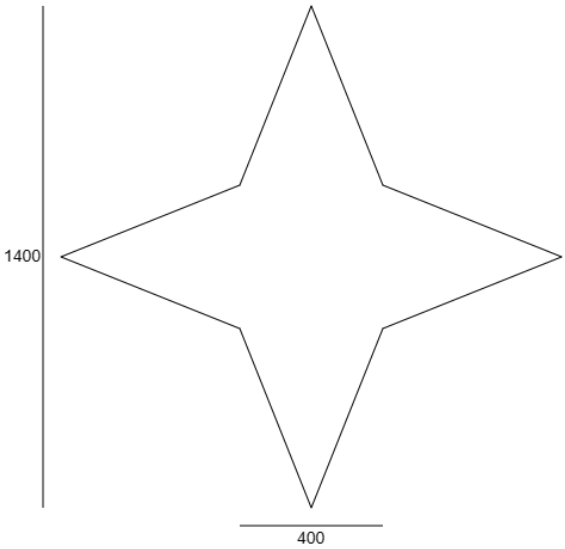
c)



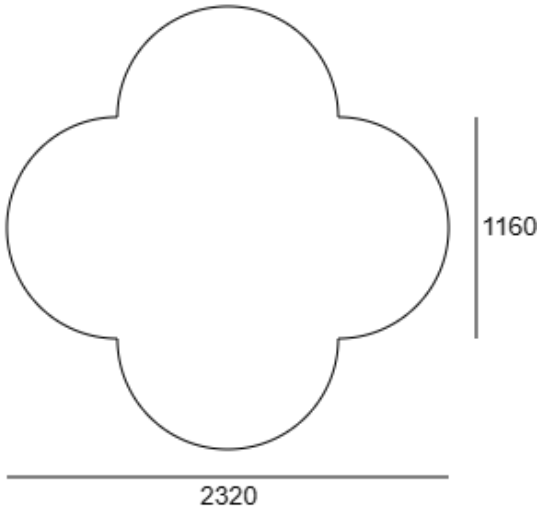
d)



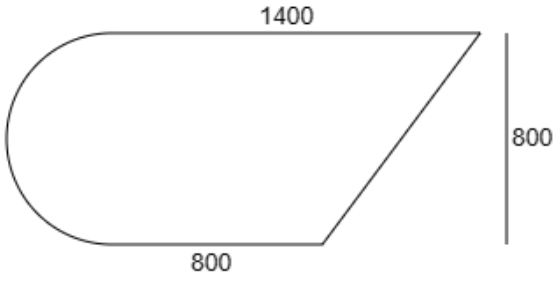
e)



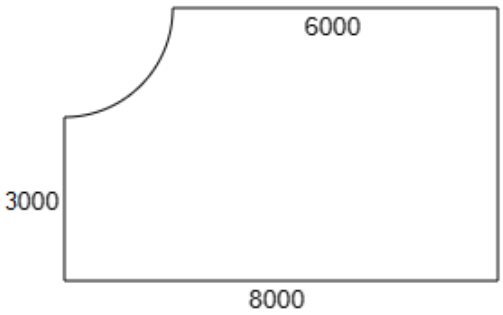
f)



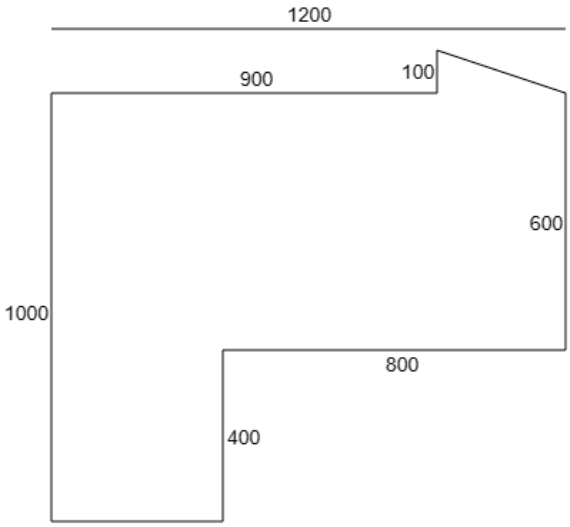
g)



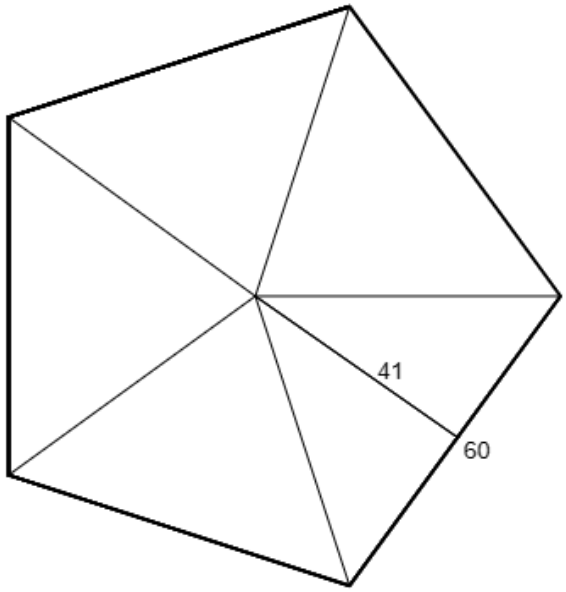
h)



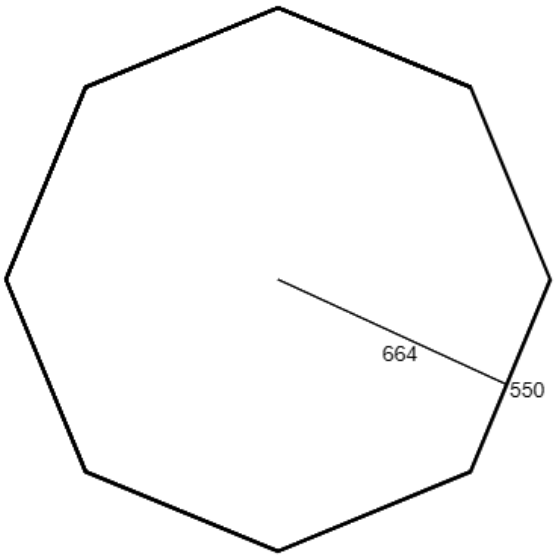
i)


1200
900
100
600
1000
800
400

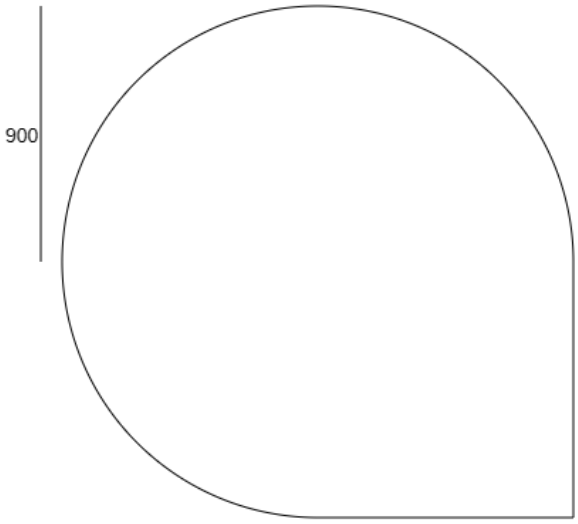
j)


41
60

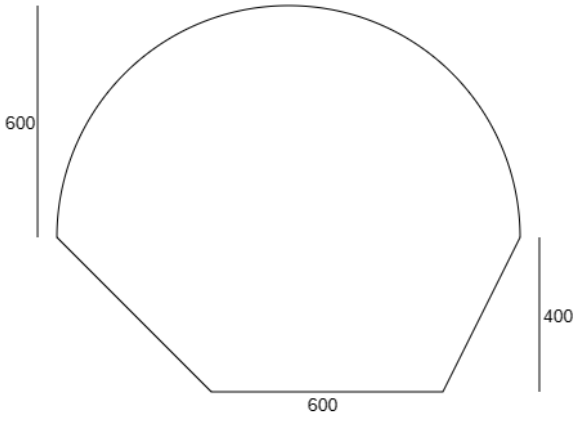
k)


664
550

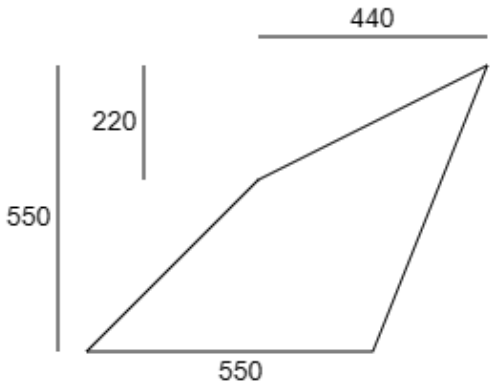
l)


900

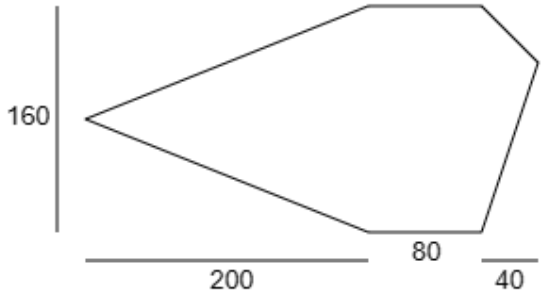
m)


600
400
600

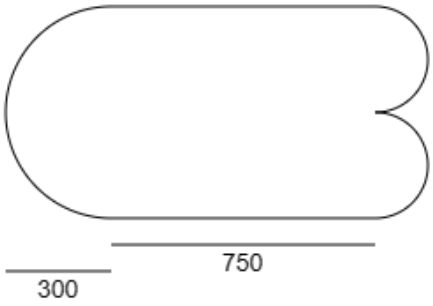
n)

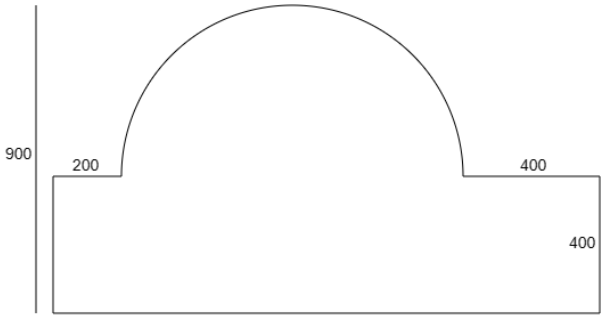

440
220
550
550

o)

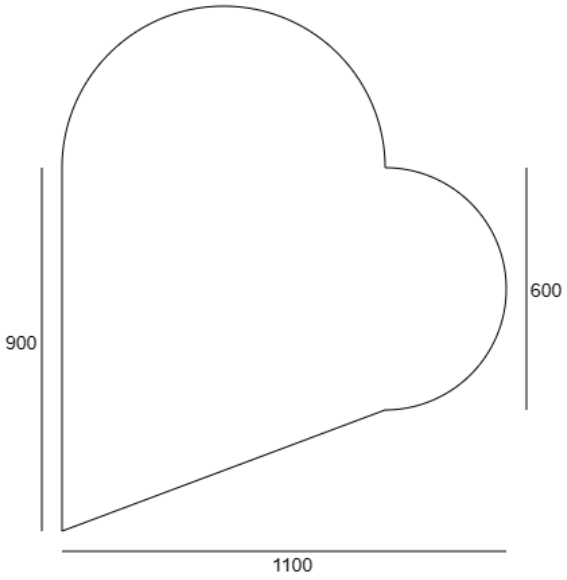

160
80
200
40

p)


750
300



q)



r)

Vorgehensweise: Zur Ermittlung des Flächeninhalts ist für die Teilflächen die obige Formelsammlung anzuwenden, die Teilflächeninhalte sind zusammenzuaddieren, gegebenenfalls sind Flächeninhalte auch zu subtrahieren.

Lösungen:

Flächeninhalt A =	mm^2	cm^2	m^2
a)	1587600	15876	1,5876
b)	14400	144	0,0144
c)	400000	4000	0,4
d)	414000	4140	0,414
e)	560000	5600	0,56
f)	3459263,54	34592,6354	3,45926354
g)	1131327,41	11313,2741	1,13132741
h)	39214601,84	392146,0184	39,21460184
i)	895000	8950	0,895
j)	6150	61,5	0,00615
k)	1460800	14608	1,4608
l)	2718517,54	27185,1754	2,71851754
m)	925486,68	9254,8668	0, 92548668
n)	211750	2117,5	0,21175
o)	32000	320	0,032
p)	662057,5	6620,575	0, 6620575
q)	1032699,08	10326,9908	1,03269908
r)	992699,08	9926,9908	0, 99269908

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