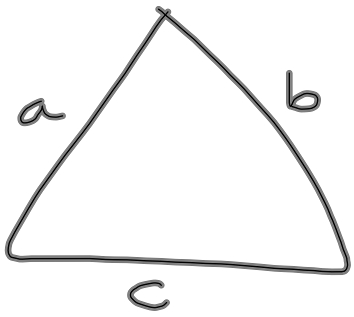
2-27-14
3rd Trig

Area

Heron's formula

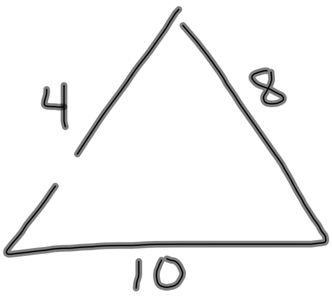


semiperimeter $= \frac{1}{2}(a+b+c)$

↑ call it s

$$A = \sqrt{s \cdot (s-a) \cdot (s-b)(s-c)}$$

Example



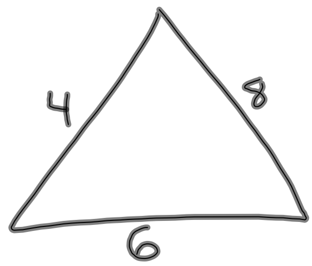
$s = \frac{1}{2}$ of perimeter

$s = 11$

$$A = \sqrt{11 \cdot (11-4)(11-8)(11-10)}$$

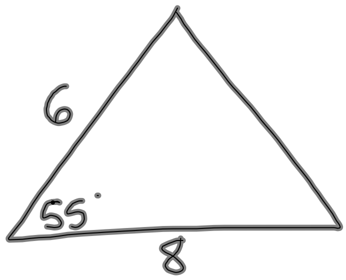
$$\sqrt{11 \cdot 7 \cdot 3 \cdot 1}$$

$$\sqrt{231} \approx 15.2 \text{ cm}^2$$

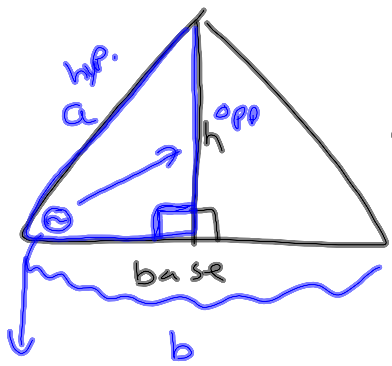


$$s = \frac{1}{2}(4+6+8) = 9$$

$$A = \sqrt{9\cdot(9-4)(9-6)(9-8)}$$
$$= \sqrt{9\cdot 5\cdot 3\cdot 1}$$
$$\approx 11.6$$



$$A = \frac{1}{2}\cdot 8\cdot 6\cdot \sin 55$$
$$\approx 19.7\ cm^2$$

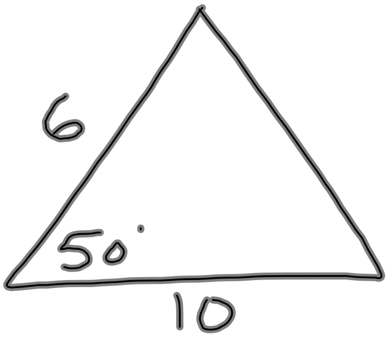


$$A = \frac{1}{2}\cdot b\cdot h$$
$$\frac{1}{2}\cdot b\cdot a\cdot \sin\theta$$

$$\sin\theta = \frac{h}{a}$$

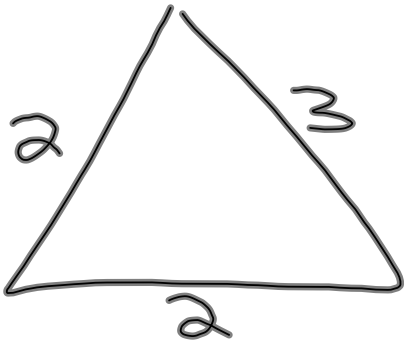
$$h = a\cdot \sin\theta$$

$$A = \frac{1}{2}\cdot a\cdot b\cdot \sin\theta$$



$$A = \frac{1}{2} \cdot 6 \cdot 10 \cdot \sin 50^\circ$$

$$\approx 23.0 \text{ cm}^2$$



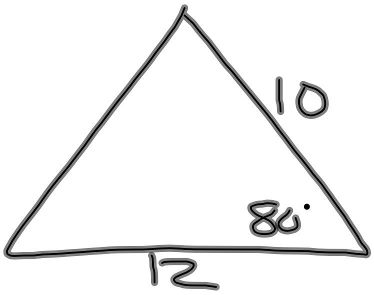
$$s = 3\tfrac{1}{2}$$

$$A = \sqrt{s \cdot (s-a)(s-b)(s-c)}$$

$$= \sqrt{3.5 \cdot (3.5-2)(3.5-2)(3.5-3)}$$

$$\approx \sqrt{3.9}$$

$$\approx 2.0 \text{ cm}^2$$



$$A = \frac{1}{2} \cdot 10 \cdot 12 \cdot \sin 80^\circ$$

$$\approx 59.1 \text{ cm}^2$$

8-4

(19) How many ordered pairs of integers (x, y) are solutions to $x^2+y^2<9$?

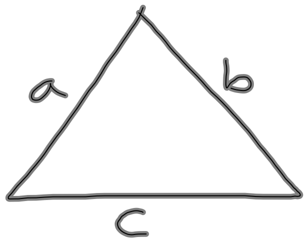
$(0,0)$	1	$(\pm1,\pm2)$	4
$(0,\pm1)$	2	$(\pm2,0)$	2
$(0,\pm2)$	2	$(\pm2,\pm1)$	4
$(\pm1,0)$	2	$(\pm2,\pm2)$	4
$(\pm1,\pm1)$	4		

(25)

2-27-14

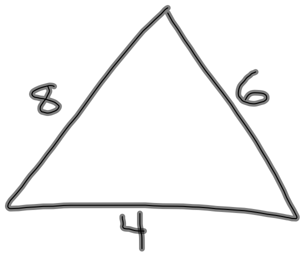
4th Trig

Heron's Formula



Semiperimeter is $\frac{1}{2}(a+b+c)$

$$A = \sqrt{S\cdot(s-c)(s-b)(s-a)}$$



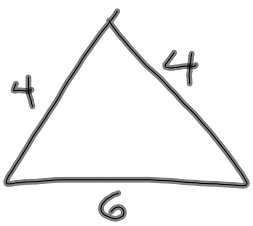
$P = 18$

$\therefore$ semiperimeter $= 9$

$$A = \sqrt{9\cdot(9-8)(9-4)(9-6)}$$

$$= \sqrt{9\cdot 1\cdot 5\cdot 3}$$

$$\approx 11.6 \text{ cm}^2$$



$P = 14$

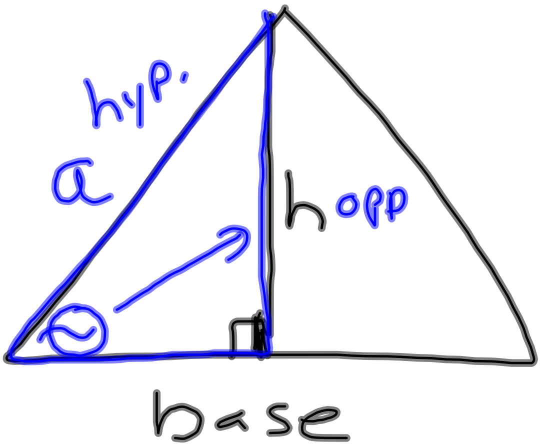
$S = 7$

$$A = \sqrt{7\cdot(7-4)(7-4)(7-6)}$$

$$= \sqrt{7\cdot 3\cdot 3\cdot 1}$$

$$= \sqrt{63}$$

$$\approx 7.9 \text{ cm}^2$$

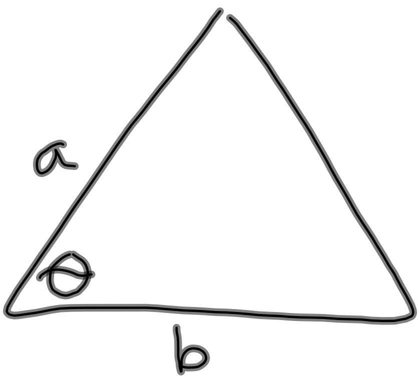


$$A = \frac{1}{2} \cdot b \cdot h$$

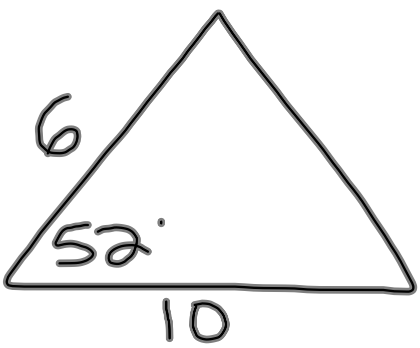
$$= \frac{1}{2} \cdot b\, a \cdot \sin\theta$$

$$\frac{\sin\theta}{1} = \frac{h}{a}$$

$$h = a \cdot \sin\theta$$

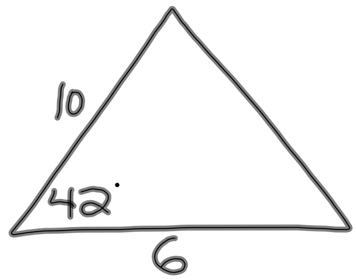


$$A = \frac{1}{2} \cdot a \cdot b \sin\theta$$



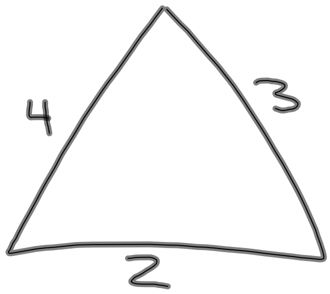
$$A = \frac{1}{2} \cdot 6 \cdot 10 \cdot \sin 52^\circ$$

$$\approx 23.6\ cm^2$$



$A = \frac{1}{2} \cdot 6 \cdot 10 \cdot \sin 42°$

$\approx 20.1 \text{ cm}^2$



$p = 9$

$s = 4.5$

$A = \sqrt{4.5 \cdot .5 \cdot 2.5 \cdot 1.5}$

$\approx 2.9 \text{ cm}^2$

8-4 (19)

How many ordered pairs of integers (x, y) satisfy

$x^2 + y^2 < 9$? (25)

$(0,0)$	1	$(\pm1,\pm2)$	4
$(0,\pm1)$	2	$(\pm2,0)$	2
$(0,\pm2)$	2	$(\pm2,\pm1)$	4
$(\pm1,0)$	2	$(\pm2,\pm2)$	4
$(\pm1,\pm1)$	4		