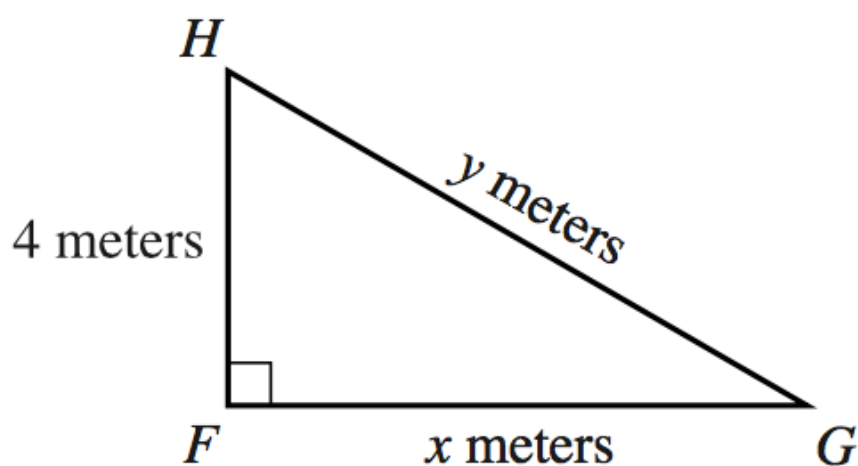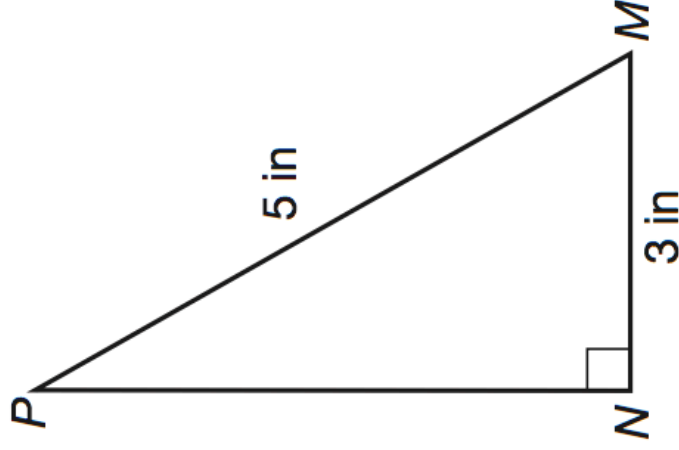**31.** For $\triangle FGH$, shown below, which of the following is an expression for y in terms of x ?

A. $x + 4$

B. $\sqrt{x^2 + 4}$

C. $\sqrt{x^2 + 8}$

D. $\sqrt{x^2 - 16}$

E. $\sqrt{x^2 + 16}$

14. In the figure below, $\overline{MN}$ = 3 inches and $\overline{PM}$ = 5 inches. Find the area of triangle MNP.

f. 6 square inches

g. 15 square inches

h. 7.5 square inches

i. 12 square inches

j. 10 square inches

45. The area of square WXYZ is 100 square centimeters. Find the length of diagonal WY in centimeters.

a. $10\sqrt{2}$ cm

b. 20 cm

c. 10 cm

d. $2\sqrt{5}$ cm

e. $10\sqrt{5}$ cm

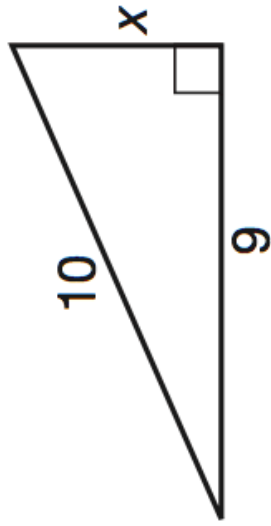**46.** Find the hypotenuse of the triangle below.

f. $\sqrt{13}$

g. $\sqrt{5}$

h. $\sqrt{65}$

i. $\sqrt{97}$

j. 13

53. What is the length of the missing leg in the right triangle below?

a. $\sqrt{181}$

b. 1

c. $\sqrt{19}$

d. 4

e. $\sqrt{21}$

74. Triangle XYZ is an equilateral triangle. $\overline{YW}$ is an altitude of the triangle. If $\overline{YX}$ is 14 inches, what is the length of the altitude?
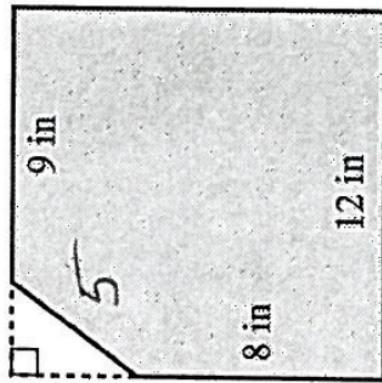
f. $7\sqrt{3}$ inches

g. 7 inches

h. $7\sqrt{2}$ inches

i. $6\sqrt{3}$ inches

j. 12 inches

40. The polygon below was a square with 12-inch sides before a triangle was cut off. What is the perimeter, in inches, of this polygon?
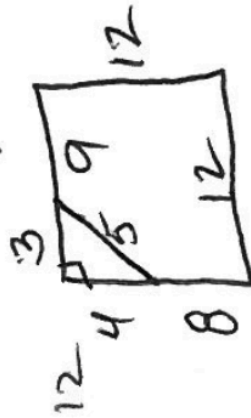
(handwritten: 3)

(handwritten diagram: square with 9 in, 5, 8 in, 12 in labels; 4 and dashed lines)

9 in

5

8 in

12 in

F. 41
G. 43
H. 46
J. 48
K. 53

(handwritten annotations:)

Perimeter and Pythagorean triple

$5 + 9 + 12 + 12 + 8 =$

46

3 / 4 / 5

12 / 9 / 5 / 12

8 / 12

12

40. What is the length of $\overline{BC}$, in inches?
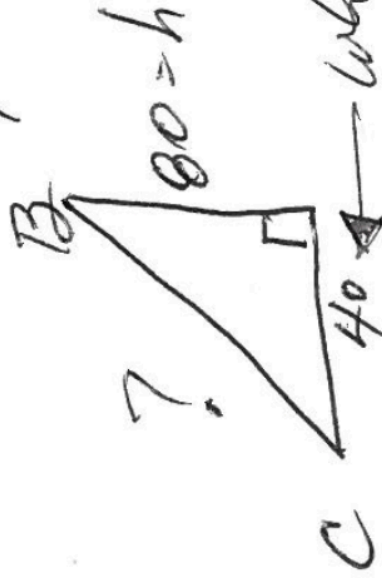
F. 90

G. 100

H. $\sqrt{4,800}$

→ J. $\sqrt{8,000}$

K. $\sqrt{16,400}$

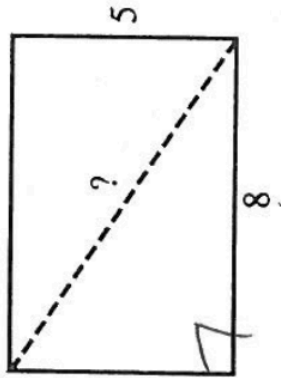Pythagorean Theorem

$(80)^2 + (40)^2 = (?)^2$

B

?

$80 > h$

$\sqrt{8000} = ?$

40 C

What's left After you subtract 60 from 100

41. What is the radius, in inches, of the largest circle that
can be drawn so that no point of the circle is outside

29. How many centimeters long is the diagonal of a rectangle that is 5 centimeters wide and 8 centimeters long, as shown below?

A. 13

B. $\sqrt{13}$

C. $\sqrt{40}$

→ D. $\sqrt{89}$

E. $\sqrt{99}$
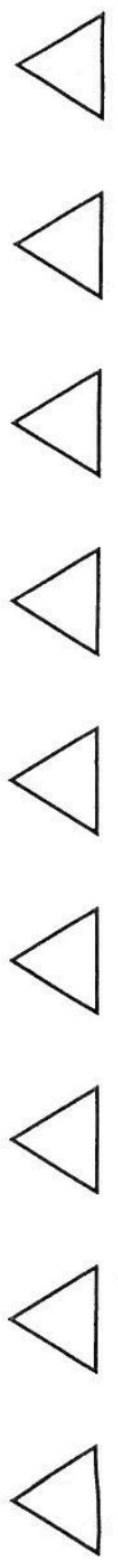
5

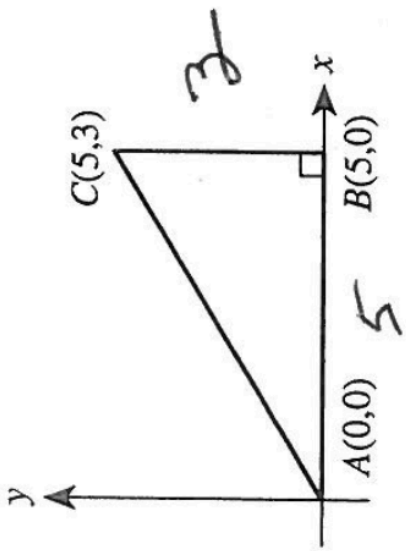Pythagorean theorem

$5^2 + 8^2 = (?)^2$

$25 + 64 = (?)^2$

$89 = (?)^2$

$\sqrt{89} = ?$

DO YOUR FIGURING HERE.

$3^2 + 5^2 = H^2$

$34 = H^2$

$\dfrac{34}{\sqrt{34}} = H^2$

$\sqrt{34} = H$

$S = \dfrac{O}{H}$

51. In the figure below, what is the sine of $\angle BAC$?

$C(5,3)$

$A(0,0)$

$B(5,0)$

y

x

3

5

A. $\dfrac{3}{5}$

B. $\dfrac{3}{4}$
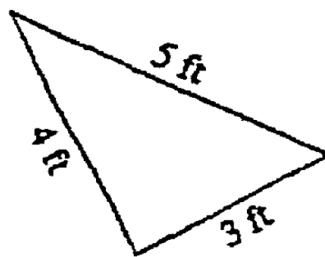
C. $\dfrac{5}{3}$

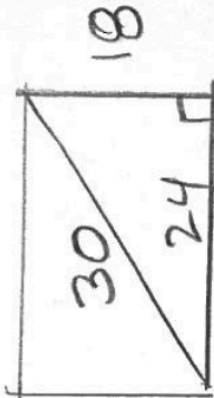D. $\dfrac{3}{\sqrt{34}}$

E. $\dfrac{5}{\sqrt{34}}$

6. How many triangles that have integer side lengths are similar to the triangle shown below?

F. 1
G. 2
H. 3
J. 4
K. Infinitely many

20. Sarah swims in a rectangular-shaped swimming pool 18 feet wide and 24 feet long. About how many feet long is a diagonal of the surface of the water in the pool?

F. 21
G. 30
H. 42
J. 441
K. 900

DO YOUR FIGURING HERE.

Pythagorean Theorem

Think Pythagorean Triples

$18 \div 6 = 3$
$24 \div 6 = 4$
$30 \div 6 = 5$

This is a multiple of the 3, 4, 5 Triple