You will use the properties of 45°-45°-90° and 30°-60°-90° triangles

Triangle 1

$45°$ $x = \sqrt{2}$

1

$45°$

1

$$1^2 + 1^2 = x^2$$
$$1 + 1 = x^2$$
$$\sqrt{2} = \sqrt{x^2}$$
$$\sqrt{2} = x$$

Triangle 2

45 $x = 3\sqrt{2}$

3

45

3
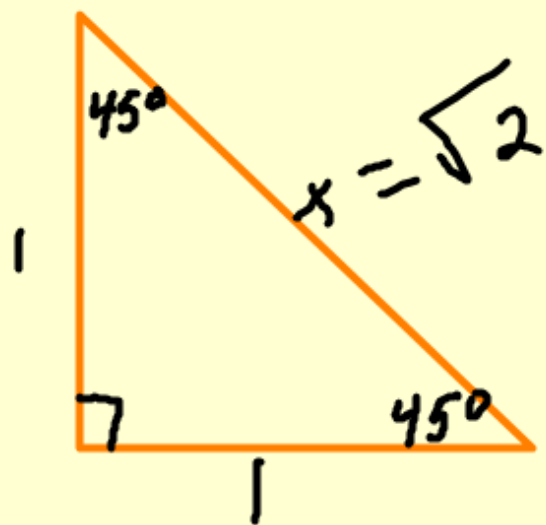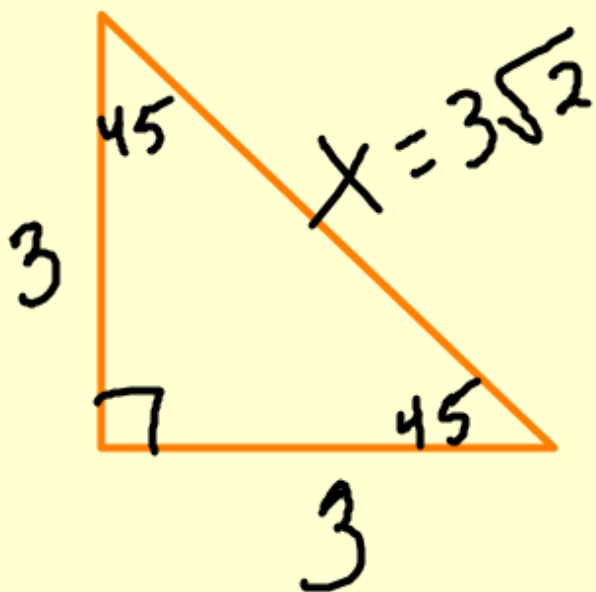
$$3^2 + 3^2 = x^2$$
$$9 + 9 = x^2$$
$$\sqrt{18} = \sqrt{x^2}$$
$$\sqrt{18} = x$$
$$\sqrt{9}\sqrt{2}$$
$$3\sqrt{2} = x$$

Triangle 3

$45°$ $x = 5\sqrt{2}$

5

$45°$

5
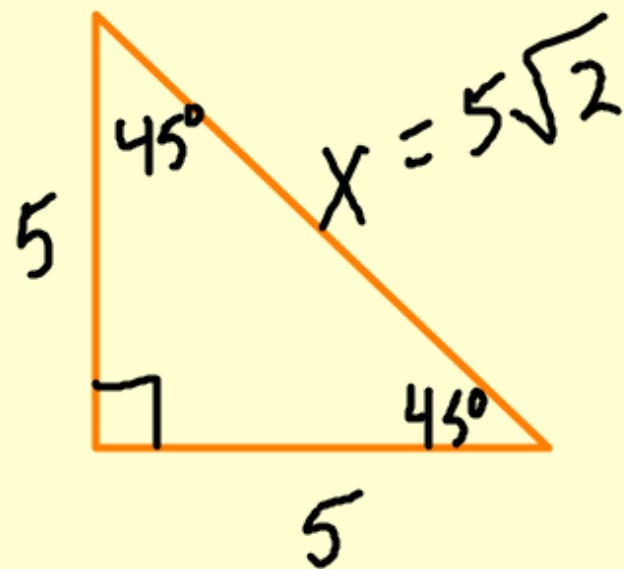
$$5^2 + 5^2 = x^2$$
$$25 + 25 = x^2$$
$$50 = x^2$$
$$\sqrt{50} = x$$
$$\sqrt{25}\sqrt{2} = x$$
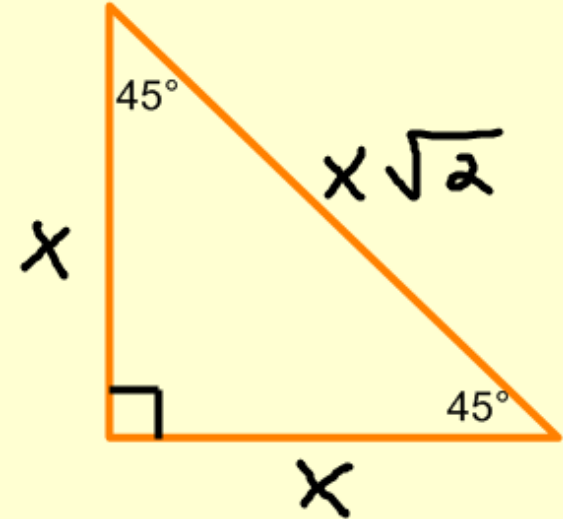$$5\sqrt{2} = x$$

In a 45°- 45°- 90°△, the length of the hypotenuse is $\sqrt{2}$ times the length of the leg

Find hyp

→ $hyp = leg\sqrt{2}$
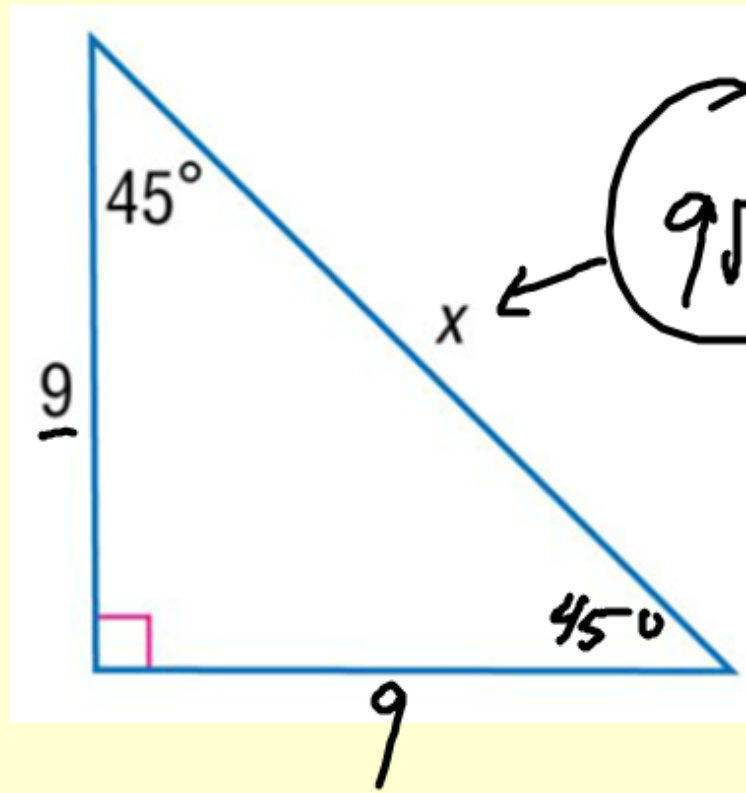
find leg → $leg = \dfrac{hyp}{\sqrt{2}}$

45°

$x\sqrt{2}$

x

45°

x

Find *x*

45°

9

45°

9

x

$9\sqrt{2}$

$hyp = leg\sqrt{2}$

$x = 9\sqrt{2}$

Find x
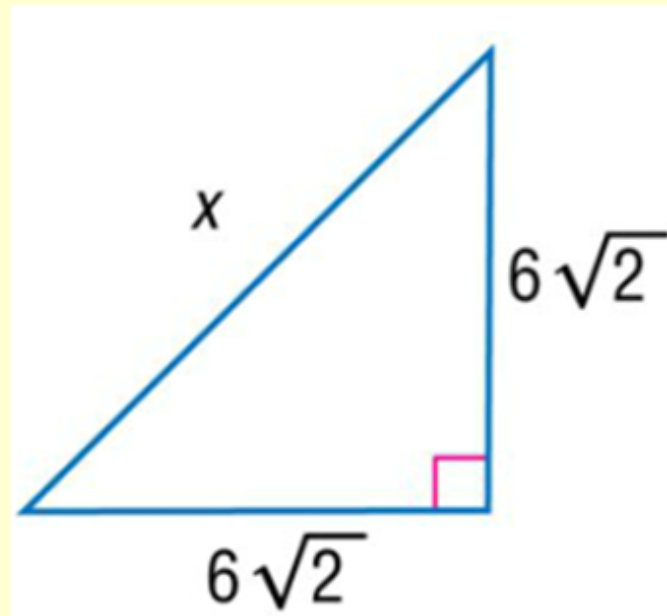
$$\text{hyp} = \text{leg} \sqrt{2}$$

$$x = (6\sqrt{2})(\sqrt{2})$$

$$x = 6\sqrt{4}$$

$$x = 6 \cdot 2$$

$$x = 12$$

Find *a*

$$leg = \frac{hyp}{\sqrt{2}}$$

$$a = \frac{8}{\sqrt{2}} \frac{\sqrt{2}}{\sqrt{2}}$$

$$a = \frac{8\sqrt{2}}{2}$$

$$\boxed{a = 4\sqrt{2}}$$