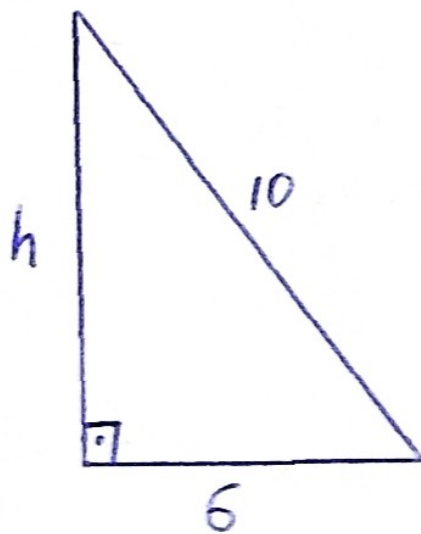**1)**

$$a^2 = b^2 + c^2$$
$$a^2 = (\sqrt{3})^2 + (\sqrt{4})^2$$
$$a^2 = 3 + 4$$
$$a = \sqrt{7}$$
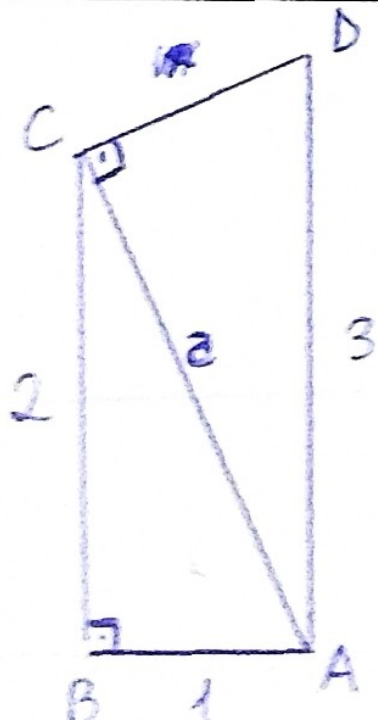
Ⓑ

2)

$$10^2 = h^2 + 6^2$$
$$h^2 = 10^2 - 6^2$$
$$h^2 = 100 - 36$$
$$h = \sqrt{64} = 8\,m$$

3)

No $\triangle ABC$:

$$a^2 = 2^2 + 1^2$$
$$a^2 = 4 + 1$$
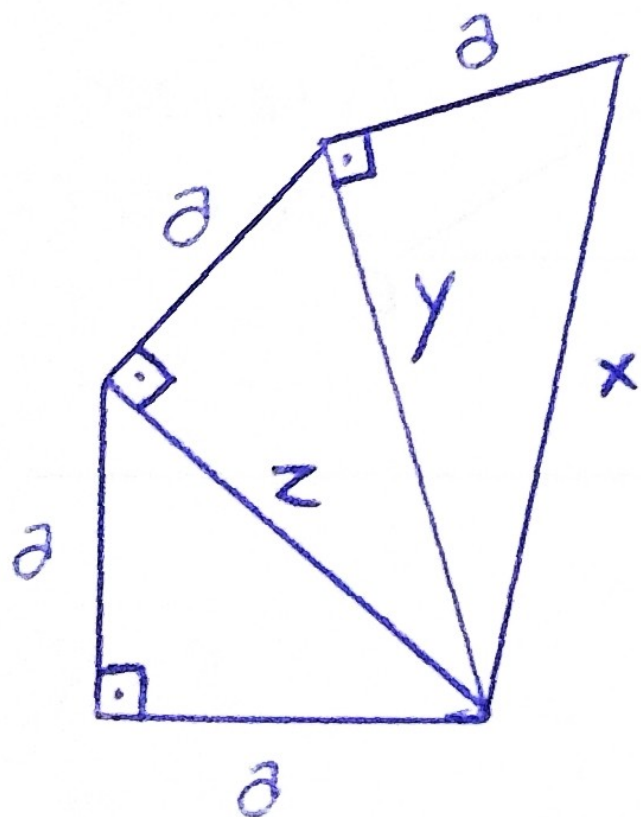$$a = \sqrt{5}$$

Ⓑ

No $\triangle ACD$:

$$3^2 = a^2 + \overline{CD}^2$$
$$3^2 = \sqrt{5}^2 + \overline{CD}^2$$
$$\overline{CD}^2 = 9 - 5$$
$$\overline{CD} = \sqrt{4} = 2$$

4)

$$z^2 = a^2 + a^2$$
$$z^2 = 2a^2$$
$$z = a\sqrt{2}$$

$$y^2 = a^2 + z^2$$
$$y^2 = a^2 + (a\sqrt{2})^2$$
$$y^2 = a^2 + 2a^2$$
$$y = a\sqrt{3}$$
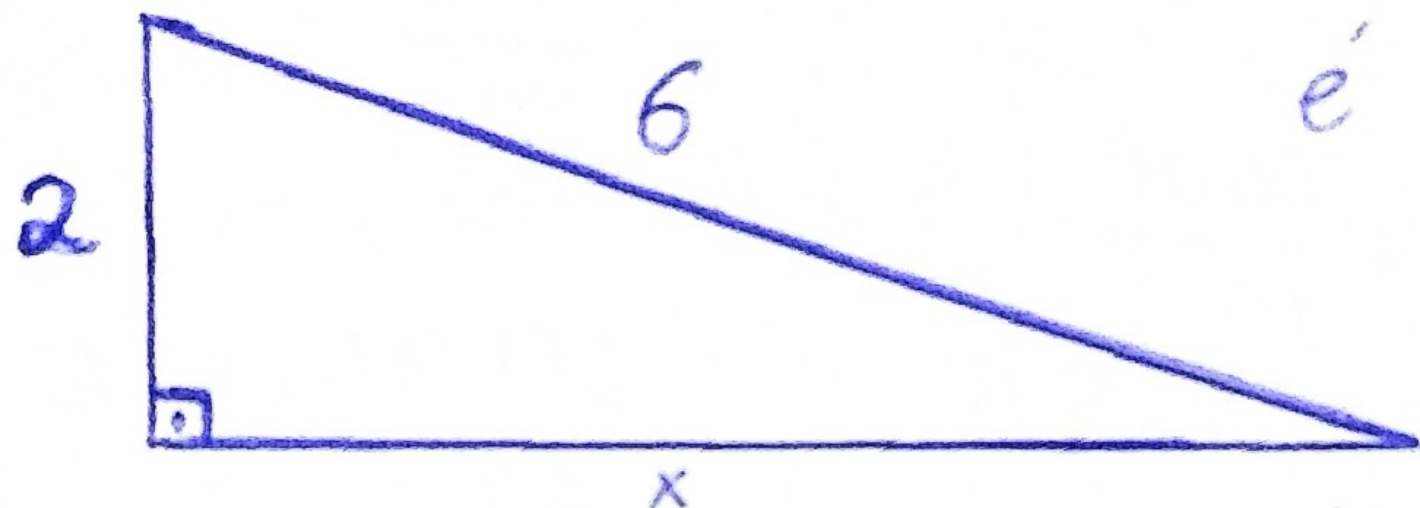
$$x^2 = a^2 + y^2$$
$$x^2 = a^2 + (a\sqrt{3})^2$$
$$x^2 = a^2 + 3a^2$$
$$x^2 = 4a^2$$
$$x = 2a$$

Ⓑ

5)

Área de um triâ

é $A = \dfrac{h \cdot b}{2}$

$a^2 = b^2 + c^2$

$6^2 = 2^2 + x^2$

$x^2 = 36 - 4$

$x = \sqrt{32} = 4\sqrt{2}$

$A = \dfrac{h \cdot b}{2}$

©
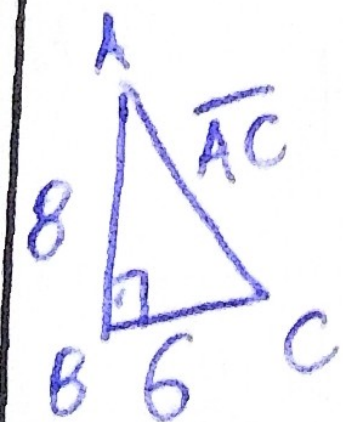
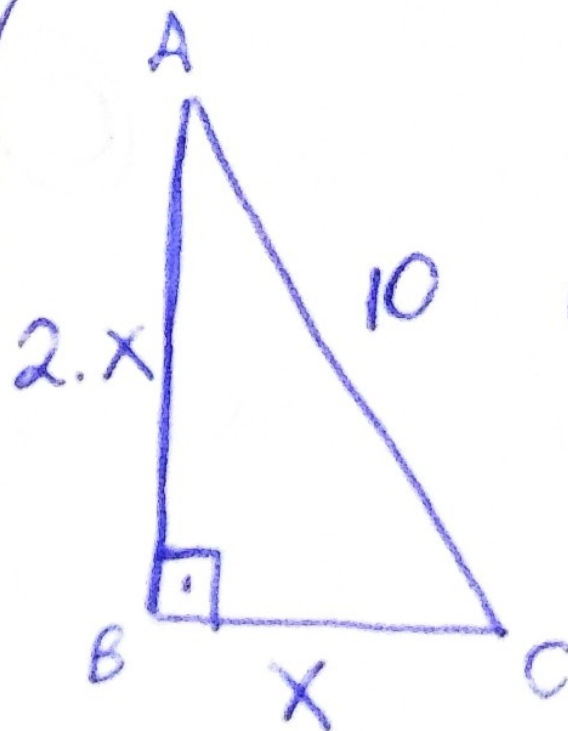$A = \dfrac{2 \cdot 4\sqrt{2}}{2}$

$A = 4\sqrt{2}$

6)

$$\overline{AC}^2 = 8^2 + 6^2$$

$$\overline{AC} = \sqrt{100}$$

$$\overline{AC} = 10$$

$$10^2 = x^2 + (2x)^2$$

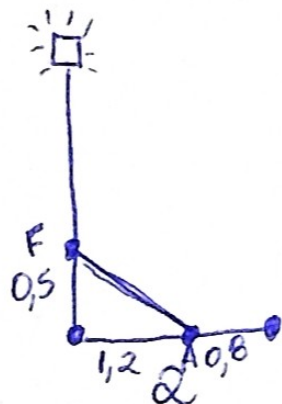$$100 = x^2 + 4x^2$$

$$100 = 5x^2$$

$$x^2 = 20$$

$$x = \sqrt{20}$$

$$x = \sqrt{20} = 2\sqrt{5}$$

(A)

7) Vel. da Aranha = 0,16 m/s

Vel. da Formiga = 0,10 m/s

Após 5 segundos, a Aranha
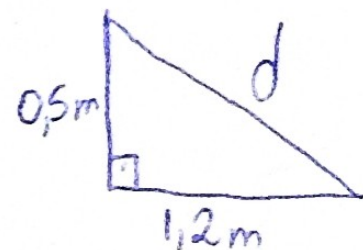andou 0,8m e a formiga
0,5m

$$d^2 = 0,5^2 + 1,2^2$$

$$d^2 = \left(\frac{1}{2}\right)^2 + \left(\frac{12}{10}\right)^2$$

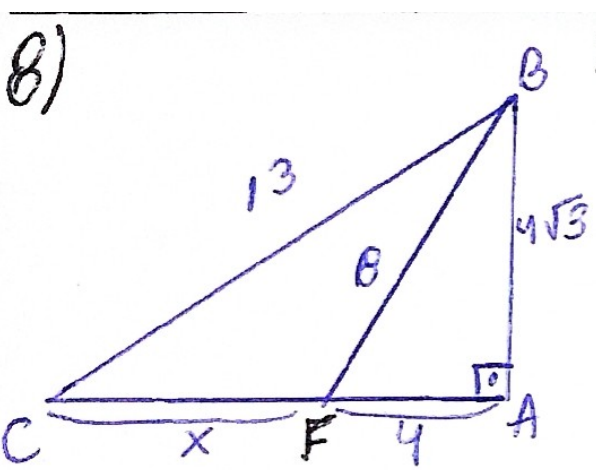$$d^2 = \frac{1}{4} + \frac{144}{100}$$

$$d^2 = \frac{25 + 144}{100} = \frac{169}{100}$$

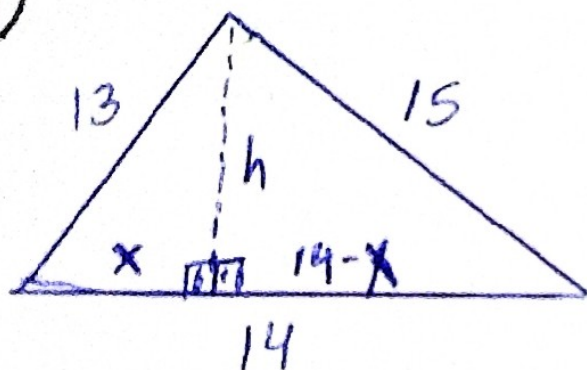$$d = \sqrt{\frac{169}{100}} = \frac{13}{10} \text{ ou } 1,3m$$

B

8)

$\triangle ABF$

$8^2 = \overline{AB}^2 + 4^2$

$\overline{AB}^2 = 48$

$\overline{AB} = \sqrt{48} = 4\sqrt{3}$

$\triangle ABC$

$13^2 = (4\sqrt{3})^2 + (x+4)^2$

$169 = 16 \cdot 3 + x^2 + 8x + 16$

$x^2 + 8x - 105 = 0$

$x = \dfrac{-8 \pm \sqrt{484}}{2}$

$x' = \dfrac{-8 + 22}{2} = 7$

$x'' = \dfrac{-8 - 22}{2} = -15$

O segmento x vale 7

9)

Triangle with sides labeled: left side 13, right side 15, base 14. An altitude h is drawn from the apex to the base, dividing it into x and $14-x$, with a right angle marked at the base.

$$13^2 = h^2 + x^2 \implies h^2 = 169 - x^2$$

$$15^2 = h^2 + (14-x)^2 \implies h^2 = 225 + 28x - 196 - x^2$$

$$\to h^2 = h^2$$

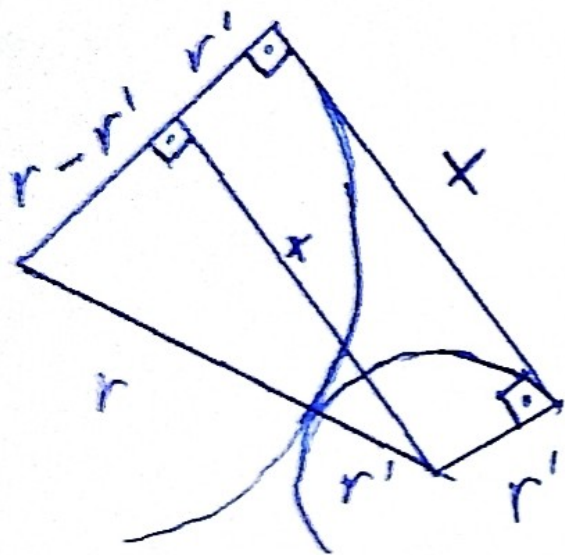$$169 - x^2 = 29 + 28x - x^2$$

$$169 = 29 + 28x$$

$$28x = 140$$

$$x = 5$$

$$h^2 = 169 - 5^2$$

$$h^2 = 144$$

$$h = 12$$

10)

$$(r + r')^2 = x^2 + (r - r')^2$$

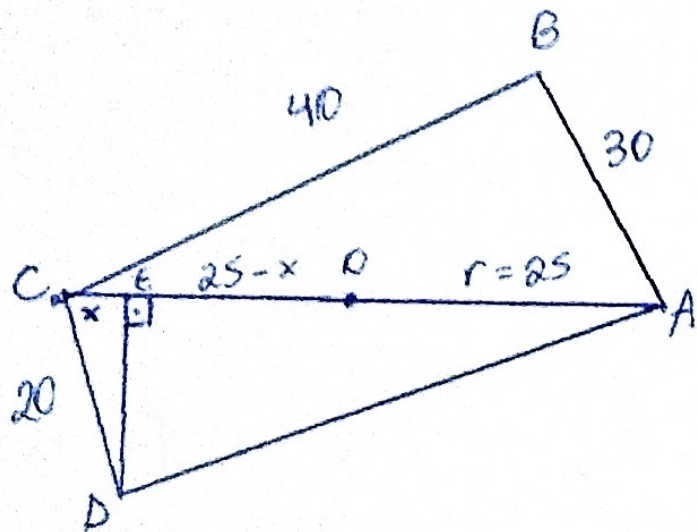$$r^2 + 2r \cdot r' + r'^2 = x^2 + r^2 - 2r \cdot r' + r'^2$$

$$x^2 = r^2 + 2r \cdot r' + r'^2 - r^2 + 2r \cdot r' - r'^2$$

$$x^2 = 2 \cdot r \cdot r' + 2r \cdot r'$$

$$x^2 = 4 \cdot r \cdot r'$$

$$x = 2\sqrt{r \cdot r'}$$

11)

$\triangle ABC$ é Pitagórico

$\overline{AC}^2 = 1600 + 900$

$\overline{AC} = \sqrt{2500}$

$\overline{AC} = 50$

Ⓒ

Utilizando a relação métrica

$\dfrac{\overline{AC}}{\overline{CD}} = \dfrac{\overline{CD}}{x} \Rightarrow \dfrac{50}{20} = \dfrac{20}{x}$

$20^2 = 50x$

$400 = 50x$

$x = 8$