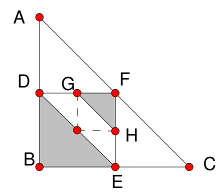
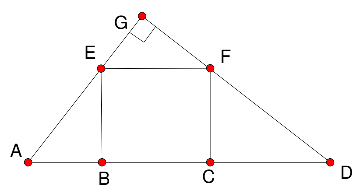
1. This problem may have been marked incorrectly. Notice that the larger shaded triangle is $\frac{1}{4}$ the area of $\triangle ABC$. Next if we draw segments from G and H to the midpoint of $\overline{DE}$, notice that the smaller shaded triangle is $\frac{1}{4}$ the area of the larger shaded triangle or $\frac{1}{16}$ the area of $\triangle ABC$. Our ratio, then is $\dfrac{\frac{1}{4}+\frac{1}{16}}{1-\frac{1}{4}-\frac{1}{16}} = \boxed{\dfrac{5}{9}}$.



2. Square $BCFE$ is inscribed in right triangle AGD, as shown below. If $AB = 28$ units and $CD = 58$ units, what is the area of square $BCFE$? $\boxed{\text{1624 sq units}}$



3. $\boxed{\text{18 cm}}$

4. We can use the distance formula to get the following two equations from the given information:
$$\begin{cases}\sqrt{x^2+y^2}=\sqrt{10}\\ \sqrt{x^2+(y-3)^2}=\sqrt{13}\end{cases}$$
This is equivalent to the following system: $\begin{cases}x^2+y^2=10\\ x^2+y^2-6y+9=13\end{cases}$

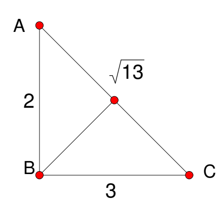
When we solve this system we get $(x, y) = (3, 1)$. We can now use the distance formula to find the distance to point C:

$\sqrt{(5-3)^2+(0-1)^2} = \sqrt{4+1} = \boxed{\sqrt{5}}$.

5. $\boxed{\text{25 sq units}}$

6. $\boxed{\text{9 units}}$

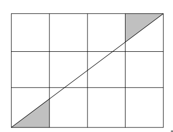
7. We can use Pythagorean Theorem to find the length of the hypotenuse to be $\sqrt{13}$.



We know the area is $\frac{1}{2} \times 2 \times 3 = 3$. To find the altitude to the hypotenuse, call it x, we use the following:

$$\frac{1}{2}\sqrt{13}x = 3$$
$$x = \frac{6}{\sqrt{13}} = \boxed{\frac{6\sqrt{13}}{13}}$$

8. I labelled one of the triangles formed by the diagonal as ABC. Notice that the two triangles formed by the shaded region are the same size due to symmetry. Because of this, we will find the area of one triangle and double it to get the area of the shaded region. Now notice that the bottom left triangle formed by the shaded region is similar to $\triangle ABC$, with the sides in a ratio of 1:4. This means that the ratio of the areas must be 1:16. The area of $\triangle ABC$ is $\frac{1}{2} \times 3 \times 4 = 6$. Thus the area of the small shaded triangle is $6 \div 16 = \frac{3}{8}$. Again, we are doubling this area to get the area of the entire shaded region $2 \times \frac{3}{8} = \boxed{\frac{3}{4}}$.



9. $\boxed{120^\circ}$

10. $\boxed{25\sqrt{3}}$