

1. $\boxed{234 \text{ yd}^2}$

2. If the area of the square is 64cm^2 , then each side must be 8, because $8 \times 8 = 64$. So if a rectangle has length three times that of the square, then $l = 3 \times \text{length of square} = 3 \times 8 = 24$. If the width is twice that of the square, then $w = 2 \times \text{width of square} = 2 \times 8 = 16$. So the area of the rectangle is $l \times w = 24 \times 16 = \boxed{384 \text{ cm}^2}$

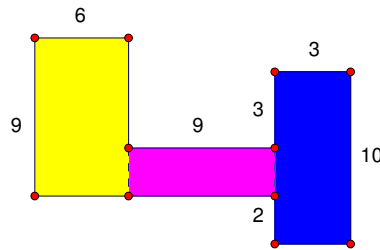
3. $\boxed{605 \text{ cm}^2}$

4. To find the shaded area, we find the area of the frame and subtract the area of the picture.

$$Area_{frame} = l \times w = 20 \times 30 = 600. \quad Area_{picture} = l \times w = 16 \times 20 = 320$$

So the shaded area is $Area_{frame} - Area_{picture} = 600 - 320 = \boxed{280}$

5. First we have to split the floor plan up into rectangles and then add the areas together.

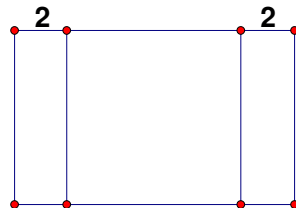


It is easy to see that the $Area_{yellow} = l \times w = 9 \times 6 = 54$. It is also easy to see that $Area_{blue} = l \times w = 10 \times 3 = 30$. Now we just need to find the area of the magenta rectangle. We know its length is 9, but we need to find its width. Notice on the blue rectangle that the whole length is 10, but the two pieces on the other side of the rectangle are 3 and 2. That means the missing length is $10 - 3 - 2 = 5$. So the width of the magenta rectangle is 5. So $Area_{magenta} = 9 \times 5 = 45$.

Finally, $Area_{figure} = Area_{yellow} + Area_{magenta} + Area_{blue} = 54 + 30 + 45 = \boxed{129}$

6. $\boxed{45}$

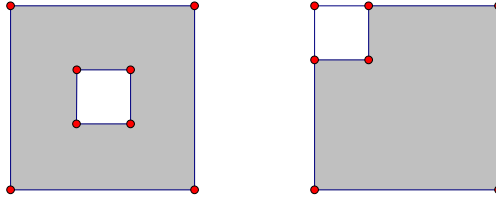
7. Here is a picture of what is happening in the problem.



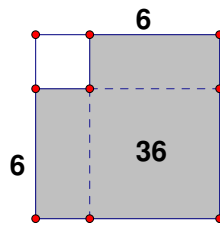
We know that the additional area is 16 cm^2 , so each side rectangle must be $16 \div 2 = 8 \text{ cm}^2$. We know that $area = length \times width$, and since $area = 8$ and $width = 2$ of each of the side rectangles, then $8 = 2 \times length$. So $length = 4$. That means the side of the square is 4, so the area of the original square must be $4 \times 4 = \boxed{16 \text{ cm}^2}$

8. $\boxed{96 \text{ cm}^2}$

9. In the below image, we see a picture mounted on a frame. But to make the problem easier, let's move the picture to the edge of the frame instead of placing it in the center.

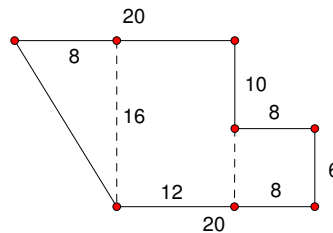


Now let's put in the information from the problem. Since the side of the frame is 6 cm more than the picture, we can see that the area of the image can be split up like so.



The problem tells us that the shaded area is 60 cm^2 . We can see that the big square has area 36, so the two shaded rectangles have a total area of $60 - 36 = 24$. Since each of the two rectangles are the same size, they have the same area, so each rectangle has area $24 \div 2 = 12$. Since the rectangles have length 6, they must have width 2. So this means the side length of the picture is $\boxed{2 \text{ cm}}$

10. First we split up the diagram into workable shapes. I have made it into two rectangles and a triangle. Then I filled in the missing dimensions.



Now we calculate areas. The area of the small rectangle on the right is $8 \times 6 = 48$. The area of the big rectangle in the middle is $12 \times 16 = 192$. The area of the triangle is $\frac{1}{2} \cdot b \cdot h$, where b is the base and h is the height. So we find the area of the triangle is $\frac{1}{2} \times 16 \times 8 = 64$. So the total area of the figure is $64 + 48 + 192 = \boxed{304}$.