1. $\boxed{12}$

2. $\boxed{9}$

3. Let n be the number. Then the information gives us the following equation:

$$\begin{aligned} n &= 9n - 32 \\ 8n &= 32 \\ n &= \boxed{4} \end{aligned}$$

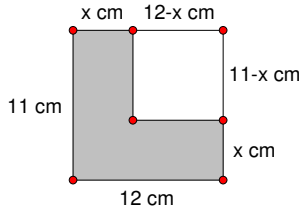
4. $\boxed{6}$

5. $\boxed{11,\ 13}$

6. The sides of the white box have measures $12 - x$ cm and $11 - x$ cm and area $(12 - x)\text{cm} \times (11 - x)$ cm $= x^2 - 23x + 132$ cm^2. We know that the area of the whole box must be 11 cm $\times$ 12 cm $= 132$ cm^2. Since the area of the shaded part is 112 cm^2, the area of the white box must be 132 cm^2 $-$ 112 cm^2 $= 20$ cm^2. This gives us the following equation:

$$\begin{aligned} x^2 - 23x + 132 &= 20 \\ x^2 - 23x + 112 &= 0 \\ (x - 7)(x - 16) &= 0 \\ x &= 7, 16 \end{aligned}$$

However, we know that $x < 12$ so $x = \boxed{7}$.



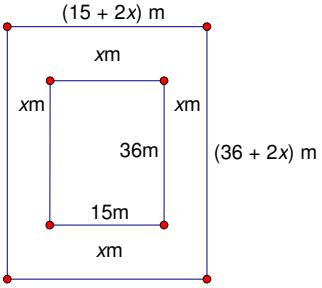
7. $\boxed{15,\ 17}$

8. Since the fence encloses the entire rectangle, its length, 220 m, is the perimeter of the rectangle. This tells us that, if the length and width are l, w respectively, then $l+w = 110$ or $l = 110-w$. We also know that the area is 2800 m^2, which tells us that $lw = 2800$. We can substitute $l = 110 - w$ into this equation to get the following:

$$\begin{aligned}(110 - w)w &= 2800\\ 110w - w^2 &= 2800\\ w^2 - 110w + 2800 &= 0\\ (w - 40)(w - 70) &= 0\\ w &= 40, 70\end{aligned}$$

This means if the width is 40 m then the length is 70 m, and if the width is 70 m then the length is 40 m. Either way the dimensions of the piece of land are $\boxed{40 \text{ m} \times 70 \text{ m}}$.

9. The lawn has an area of 36 m $\times$ 15 m = 540 m^2. Let x be the width of the path. The width of the lawn with the path is $(15+2x)$ m as you can see in the picture. The length of the lawn with the path is $(36 + 2x)$ m.



This means that the area of the path must be $(15 + 2x)(36 + 2x) - 540 = 910$:

$$\begin{aligned}(15 + 2x)(36 + 2x) - 540 &= 910\\ 540 + 102x + 4x^2 - 540 &= 910\\ 4x^2 + 102x &= 910\\ 4x^2 + 102x - 910 &= 0\\ 2(2x^2 + 51x - 455) &= 0\\ 2(2x + 65)(x - 7) &= 0\\ x &= -\frac{65}{2}, 7\end{aligned}$$

Obviously the width of the path cannot be negative, so it must be $\boxed{7 \text{ m}}$.

10. This problem may have been graded incorrectly.

Letting s, t be the speed and time of the journey respectively, $st = 120$ or $t = \frac{120}{s}$. The second piece of information gives us that $(s+15)(t-\frac{2}{5}) = 120$. We can plug $t = \frac{120}{s}$ into the equation to get:

$$(s+15)(\frac{120}{s} - \frac{2}{5}) = 120$$
$$120 + \frac{1800}{s} - \frac{2s}{5} - 6 = 120$$
$$\frac{1800}{s} - \frac{2s}{5} - 6 = 0$$

Multiply both sides by $5s$

$$9000 - 2s^2 - 30s = 0$$
$$s^2 + 15s - 4500 = 0$$
$$(s+75)(s-60) = 0$$
$$s = -75, 60$$

Obviously the car cannot be travelling at a negative speed so it must have been travelling $\boxed{60 \text{ km/h}}$.