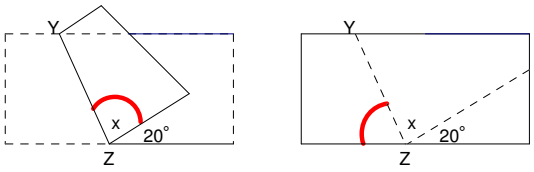
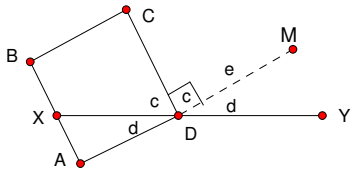
1. $\boxed{42}$

2. Let's experiment with folding a piece of paper. Take a piece of paper and fold it in front of you. What do you notice about the folded angle? If we mark x as the folding angle, as shown in the diagram, then we notice there are 2 x's, one on the folding flap, and one on the paper we cover up by folding.



   So along the 180° line along the bottom of the paper, we have 2 $\angle x$'s and one 20°. So $2x + 20 = 180$ or $2x = 160$. So $x = \boxed{80}$

3. Let's draw an extra line on the figure that will help us figure out this problem.



   Look at the line DM, which creates a right angle CDM. Then we know that XY and AM are two straight lines that intersect at D. This means that $\angle XDA = \angle MDY$. So we can write d in for $\angle MDY$. Sp of we want to know the value of d, all we do is take the big angle, $\angle CDY = e$ and subtract out the 90° angle. So we get $\angle d = \angle e - 90°$. $\boxed{\text{D}}$

4. Using our principle from problem 2, we know that the folded angle and the flap angle are the same. So in the image, $\angle ABF = \angle ABE = 75°$. We can find $\angle EBC$ by subtracting 2 75's from 180, so we get $\angle EBC = 30$. So now we need to find the ratio of $\angle ABF$ to $\angle ABE$ to $\angle CBE$: $\angle ABF : \angle ABE : \angle CBE = 75 : 75 : 30$. We need it in simplest form, so we divide by 15 and get $\boxed{5 : 5 : 2}$

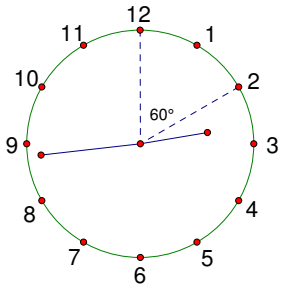
5. $\boxed{25}$

6. $\boxed{47}$

7. $\boxed{180}$

8. $\boxed{15}$

9. First: let's draw a clock at 2:44 PM. The minute hand will be a little below the 9 o'clock mark and the hour hand will be between the 2 and 3 hour marks.



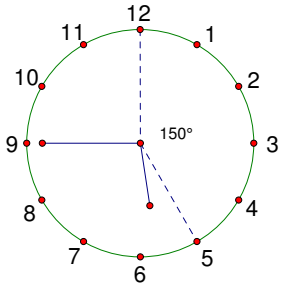
Second: let's figure out how far the minute hand moved from its starting position. The dotted line that goes from the center to 12 o'clock is where the minute hand was at the beginning of the hour. How far does the minute hand move in a minute? 360° in a circle ÷60 minutes = 6° per minute. So in 44 minutes, the minute hand has moved $44 \times 6 = 264°$.

Third: let's figure out how far the hour hand moved from its starting position. At 2:00, the hour hand was at the dotted line that goes from the center to the 2 o'clock position. How many degrees is this away from the 12 o'clock position? 60°. Now let's find out how much further down the hour hand went from it's starting position. How far does the hour hand move in a minute? 30° in an hour of the clock ÷60 minutes = .5° per minute. So in 44 minutes, the hour hand has moved another $44 \times .5 = 22°$. So if we add that to the original 60° it is away from the 12 o'clock position, the hour hand is $22 + 60 = 82°$ away from 12 o'clock.

Last: we subtract. The minute hand is 264° away from 12:00, and the hour hand is 82° away. So the angle between them is $264 - 82 = \boxed{182°}$. (You also could have answered $\boxed{178°}$, which is the measure of the angle in the opposite direction).

Note how important it is to see the start positions of the hands! You have to figure out how far the hour hand moved down at the beginning of the hour first.

10. First: draw the clock.



Second: let's figure out how far the minute hand moved from its starting position. The dotted line that goes from the center to 12 o'clock is where the minute hand was at the beginning of the hour. So in 45 minutes, the minute hand has moved $45 \times 6 = 270°$.

Third: let's figure out how far the hour hand moved from its starting position. At 5:00, the hour hand was at the dotted line that goes from the center to the 5 o'clock position. How many degrees is this away from the 12 o'clock position? 150°. Now let's find out how much further down the hour hand went from it's starting position. In 45 minutes, the hour hand

has moved another $45 \times .5 = 22.5°$. So if we add that to the original $150°$ it is away from the 12 o'clock position, the hour hand is $150 + 22.5 = 172.5°$ away from 12 o'clock.

Last: we subtract. The minute hand is $270°$ away from 12:00, and the hour hand is $172.5°$ away. So the angle between them is $270 - 172.5 = \boxed{97.5°}$. (You also could have answered $\boxed{262.5°}$, which is the measure of the angle in the opposite direction).