Dustin and Kendra want to split a bag of fun-sized candy, and decide to use the divider-chooser method. The bag contains 100 Snickers, 100 Milky Ways, and 100 Reese's, which Dustin values at $1, $5, and $2 respectively. (This means Dustin values the 100 Snickers together at $1, or $0.01 for 1 Snickers).

1. If Kendra is the divider, and in one half puts: 25 Snickers, 20 Milky Ways, and 60 Reese's, what is the value of this half in Dustin's eyes? A. under $2.00 **B.** between $2 and $3 C. between $3 and $6 D. over $6

$$\text{Dustin's value} = \frac{25}{100} \cdot \$1 + \frac{20}{100} \cdot \$5 + \frac{60}{100} \cdot \$2 = .25 + 1 + 1.20 = \$2.45$$

2. Does Dustin consider this a fair share? A. Yes **B.** No

Dustin Thinks The whole haul is worth $1 + $5 + $2 = $8, and
$8/2 = $4 > $2.45, so **No**

3. If Dustin was a divider, which of these are possible divisions consistent with his value system.
   A. 50 Snickers, 50 Milky Ways, and 50 Reese's
   B. 100 Snickers, 20 Milky Ways, and 100 Reese's
   C. 200 Snickers, 0 Milky Ways, and 100 Reese's
   D. 2 of A, B, and C
   E. All of A, B, and C

(A) is obviously half The value (since half of each candy)
(B) is worth $1 + \frac{20}{100} \cdot $5 + $2 = $(1+1+2) = $4, which is $8/2
(C) is not a possible division! (There aren't 200 Snickers!)
So The answer is D since A & B work, C doesn't

4. Three players (one divider, two choosers) are going to use Lone Divider to cut a cake. The divider cuts the cake into 3 pieces. The two choosers value the cake as follows:

	P1	P2	P3
Chooser A	30%	40%	30%
Chooser B	32%	32%	36%

Which of the following is a fair division of the cake?
   A. Chooser A gets P3; chooser B gets P2; Divider gets P1
   B. Chooser A gets P1; chooser B gets P2; Divider gets P3
   C. Chooser A gets P2; chooser B gets P1; Divider gets P3
   D. Chooser A gets P2; chooser B gets P3; Divider gets P1
   E. None of these

The only piece 'acceptable' to Chooser A is P_2 (since .4 > 1/3)
Similarly The only piece acceptable to Chooser B is P_3.

Therefore the one and only fair division is B gets P_3, A gets P_2, so the divider gets P_1.

Maggie, Meredith, Holly, and Zoe are dividing a piece of land using the lone-divider method. The values of the four pieces of land in the eyes of each player are shown below.

	Piece 1	Piece 2	Piece 3	Piece 4
Maggie	21%	27%	32%	20%
Meredith	27%	29%	22%	22%
Holly	23%	14%	41%	22%
Zoe	25%	25%	25%	25%

5. Who was the divider?
   A. Maggie   B. Meredith   C. Holly   (D.) Zoe

The divider always thinks all pieces are =. Since there are 4 people, = means 25%. Therefore, Zoe is the divider.

6. Which pieces do Meredith find acceptably large?   A. {Piece 1}   (B.) {Piece 1, Piece 2}   C. {Piece 1, Piece 2, Piece 3}   D. {Piece 2, Piece 3}   E. None of these

25% is the cutoff, so Meredith finds pieces 1 and 2 acceptable

7. Who gets Piece 1 in the final division?
   A. Maggie   (B.) Meredith   C. Holly   D. Zoe

8. Who gets Piece 3 in the final division?
   A. Maggie   B. Meredith   (C.) Holly   D. Zoe

Let's circle the acceptable pieces for the choosers (everyone but Zoe):

	Piece 1	Piece 2	Piece 3	Piece 4
Maggie	21%	(27%)	(32%)	20%
Meredith	(27%)	(29%)	22%	22%
Holly	23%	14%	(41%)	22%
Zoe	25%	25%	25%	25%

Holly must get Piece 3. Now Maggie has only 1 choice, Piece 2. That leaves Piece 1 for Meredith.