18. **(6 points)** Which of the following choices for the weight vector (w_0, w_1, w_2) can classify y as $y = (x_1 \text{ AND } x_2)$? Here AND refers to the logical AND operation, which equals to ONE when $x_1 = 1$ and $x_2 = 1$, and equals to ZERO for all other combinations.

a) (1, 1, 0)

(b) (-1.5, 1, 1)

(c) (-2, 1, 1.5)

(d) Any weights that satisfy $(-w_1 - w_2) < w_0 < min(0; -w_1; -w_2)$

$y = (x_1 \& x_2)$

e) No weights can compute the AND logical relation

Tested all 3 options to check if they are all applicable in the perceptron model

X_1	X_2	Y
0	0	0
1	0	0
1	1	1
0	1	0

19. **(3 points)** As the number of passes over training data increases for perceptron based learning, which of the following are False?

a) training accuracy increases

b) number of mistakes decreases

(c) training accuracy decreases

(d) number of mistakes increases

Please write one sentence justification

The perceptron updates through each pass thus intuitively the algorithm should have training accuracy increase and number of mistakes decrease.

20. **(3 points)** As the number of training examples used to learn a linear classifier are increased, which of the following are False?

a) training accuracy decreases

(b) testing accuracy decreases

(c) training accuracy increases

d) testing accuracy increases

Please write one sentence justification

Training accuracy should decrease with more training data. That usualy means less Overfitting. Also with more training data the testing accuracy should increase.

Extra Sheet