

Home Assignment 1

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1 Solutions

1. *“A rotor on a helicopter has four blades and rotates with 4 500 revolutions/minute, counter clockwise, (note, revolutions/minute). The rotor is filmed with a digital camera that takes 50 pictures/second. What will the perceived rotation speed be when watching the recorded film sequence? What will be the resulting direction of rotation? How does it look if the rotor goes slightly slower, with 4 499 revolutions/minute?”*
2. *“The following discrete-time signals are given.”*

$$x_1(n) = 0[1 - 3 - 13], x_2(n) = [-1 - 12 - 21 - 2]$$

“Determine the following: (3 out of 4 correct answers gives full points.”

- (a)
 - (b)
 - (c)
 - (d)
3. *“Signals are sampled, down sampled or up sampled and reconstructed ideally according to the items below. Determine what the resulting signal will be.”*
 - (a)
 - (b)