Oscilloscope Measurement Techniques (23:10)

ATTENTION: Do not just passively watch this lecture. Get in lab and actively replicate the exercise using a function generator and oscilloscope.

Determine the peak, peak to peak, and period of sinusoidal voltage with an RMS value of 4.5V and a frequency of 50Hz.

Predict how the above waveform would be displayed on an oscilloscope screen when viewed at a vertical sensitivity of 2V/div and a horizontal sensitivity of 5ms/div. Discuss proper coupling, positioning, triggering, and attenuation settings for this wave form.

Discuss the consequences of performing calculations and setting up the oscilloscope in advance.

Describe the general techniques used in manual measurement.

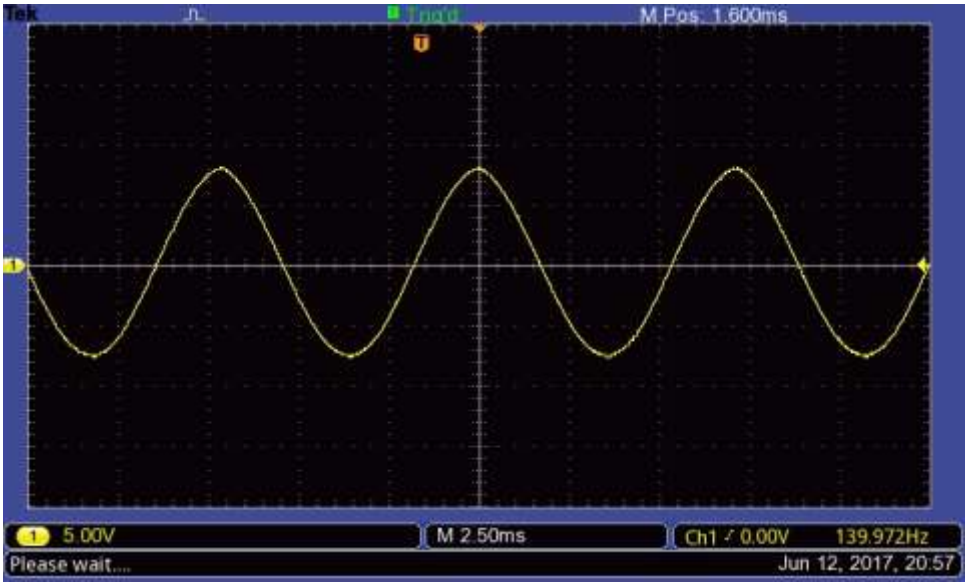
Determine the number of subdivisions in a single full division. Given a vertical sensitivity of 2V per division determine the value of each subdivision.

Discuss the advantage of repositioning the waveform when making manual measurements.

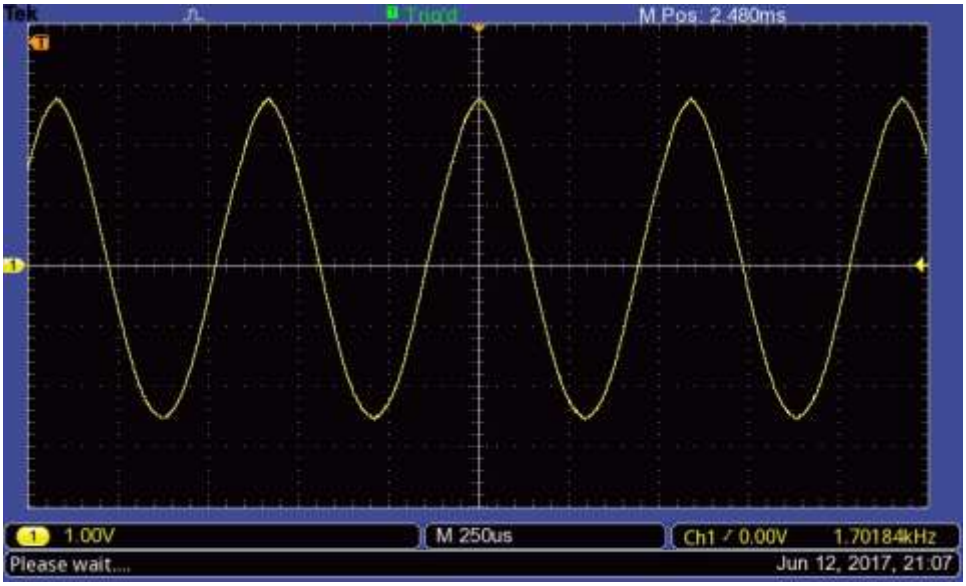
In addition to making a manual measurement of period and taking the inverse, identify another way to determine the frequency of the waveform on the Tektronix 1032B.

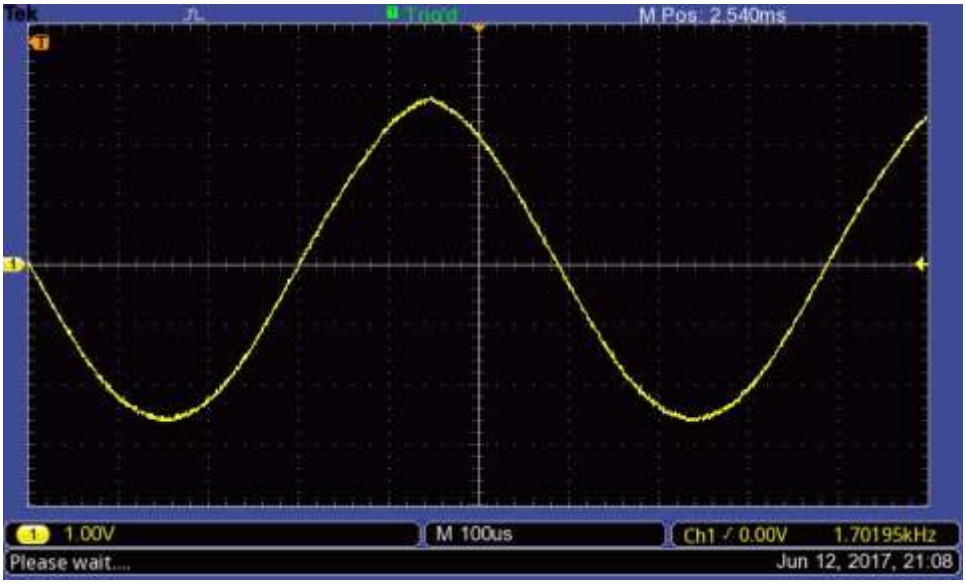
Discuss the consequences of increasing vertical or horizontal sensitivity while making manual measurements.

Measure the peak voltage, effective voltage, period, and frequency for this waveform given the vertical and horizontal sensitivity as displayed on the screen.



Measure the peak voltage, effective voltage, period, and frequency for this waveform given the vertical and horizontal sensitivity as displayed on the screen.





Given a waveform with a 1.7V_{RMS} value and a frequency of 500Hz determine how it would appear on an oscilloscope with a vertical sensitivity of 2V/div and a horizontal sensitivity of 250µs/div.

Given a waveform with a 6.5V_{RMS} value and a frequency of 15Hz determine how it would appear on an oscilloscope with a vertical sensitivity of 2V/div and a horizontal sensitivity of 5ms/div. Identify potential problems with these levels of sensitivity.

Determine appropriate levels of vertical and horizontal sensitivity for the above waveform that allow a full cycle to fit on the display.

Discuss limitations of manual measurement.

Identify how to enable and use amplitude cursors on the Tektronix 1032B.

Identify how to enable and use time cursors on the Tektronix 1032B.

Identify how to enable automated measurements on the Tektronix 1032B. List several of the properties capable of being automatically measured.

Discuss the disadvantage of selecting too many automated measurements.

Which tool is more accurate, the DMM or oscilloscope?