Red Shift, Blue Shift

Name: _____

- 1. How can you estimate the speed of a car that has passed you just by listening to the pitch of its whine?
- 2. Label the diagram below and tell if the observer perceives a pitch that is higher, lower, or just the same as the pitch heard by the driver.

A:	Hermony .		C:
	B:		

- 3. How does the doppler shift affect the color of a star?
- 4. Describe how astronomers can use the doppler shift to determine if a star is moving toward us or away and how fast?

5. If a star is moving perpendicular to our line of sight, can you use the doppler shift to determine its speed? If not, how might you determine its speed?

Red Shift, Blue Shift

Name:

Use the equation below to determine the velocity of several stars whose spectra have shifted. Are the stars moving toward or away from us? Show your work on the back side of this page.

$$V_r = \frac{\Delta \lambda \times C}{\lambda_o}$$

 V_r = radial velocity

C = speed of light (3x10⁵ km/sec or 300,000 km/sec)

 $\Lambda \lambda$ = amount of shift in nanometers

 λ_0 = unshifted wavelength in nanometers

Star 1: The spectrum has shifted from 600.0 to 600.2 nm

Velocity = _____ km/sec

Moving toward or away from us? _____

Star 2: The spectrum has shifted from 575.3 to 574.8 nm

Velocity = _____ km/sec

Moving toward or away from us?

Star 3: The spectrum has shifted from 501.6 to 502.3 nm

Velocity = _____ km/sec

Moving toward or away from us? _____

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