SPH4U Name: Date: .

Young's Double Slit Drills

1 Monochromatic violet light of wavelength 409 nm is passed through a double slit of separation 0.113 mm and creates a second-order maximum 5.5 cm from the central maximum. How far away from the source is the screen?

2 Monochromatic red light of wavelength 626 nm is passed through a double slit of separation 0.118 mm onto a screen 2.1 m away. How far away from the central maximum is the third-order antinodal line?

3 Monochromatic red light of wavelength 648 nm is passed through a double slit of separation 0.185 mm onto a screen 3.65 m away. What order nodal line is 3.2 cm from the central maximum?

4 Monochromatic light is passed through a double slit of separation 0.206 mm onto a screen 10.8 m away, creating a fourth-order nodal line 10.5 cm from the central maximum. What colour is the light?

5 Monochromatic light is passed through a double slit of separation 0.147 mm onto a screen 3.96 m away, creating a first-order nodal line 0.818 cm from the central maximum. What colour is the light?

6 Monochromatic red light of wavelength 625 nm is passed through a double slit of separation 0.163 mm onto a screen 7.51 m away. How far away from the central maximum is the third-order bright fringe?

7 Monochromatic red light of wavelength 669 nm is passed through a double slit of separation 0.203 mm and creates a third-order antinodal line 7.9 cm from the central maximum. How far away from the source is the screen?

8 Monochromatic violet light of wavelength 418 nm is passed through a double slit of separation 0.125 mm onto a screen 10.6 m away. What order dark fringe is 5.32 cm from the central maximum?

9 Monochromatic orange light of wavelength 605 nm is passed through a double slit onto a screen 2.9 m away, creating a third-order antinodal line 3.13 cm from the central maximum. What is the slit separation?

10 Monochromatic light is passed through a double slit of separation 0.221 mm onto a screen 8.31 m away, creating a second-order minimum 2.99 cm from the central maximum. What colour is the light?

Note: 3.4E4 = 3.4 x 10

Answers:

1. The screen is 7.6 m away. 2. The third-order antinodal line is 3.34E-2 m away from the central maximum. 3. The third-order nodal line is 3.20E-2 m away from the central maximum. 4. The light is yellow (572 nm). 5. The light is orange (607 nm). 6. The third-order bright fringe is 8.64E-2 m away from the central maximum. 7. The screen is 7.99 m away. 8. The second-order dark fringe is 5.32E-2 m away from the central maximum. 9. The slits are 0.168 mm apart. 10. The light is green (531 nm).

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