SPH4U Name: Date: .

Young's Double Slit Drills

1 Monochromatic light is passed through a double slit of separation 0.113 mm onto a screen 6.62 m away, creating a pattern with 24.5 cm between the first and seventh dark fringes. What colour is the light?

2 Monochromatic yellow light of wavelength 574 nm is passed through a double slit of separation 0.241 mm and creates a second-order dark fringe 1.86 cm from the central maximum. How far away from the double slit is the screen?

3 Monochromatic violet light of wavelength 418 nm is passed through a double slit of separation 0.208 mm onto a screen 3.68 m away. What order nodal line is 1.85 cm from the central maximum?

4 Monochromatic violet light of wavelength 426 nm is passed through a double slit onto a screen 6.97 m away, creating a fifth-order antinodal line 10.4 cm from the central maximum. What is the slit separation?

5 Monochromatic red light of wavelength 676 nm is passed through a double slit onto a screen 10.27 m away, creating a first-order dark fringe 2.8 cm from the central maximum. What is the slit separation?

6 Monochromatic light is passed through a double slit of separation 0.197 mm onto a screen 10.3 m away, creating a fourth-order minimum 9.83 cm from the central maximum. What colour is the light?

7 Monochromatic light is passed through a double slit of separation 0.117 mm onto a screen 2.68 m away, creating a fourth-order antinodal line 5.57 cm from the central maximum. What colour is the light?

8 Monochromatic blue light of wavelength 452 nm is passed through a double slit of separation 0.148 mm onto a screen 5.37 m away. How far away from the central maximum is the second-order maximum?

9 Monochromatic light is passed through a double slit of separation 0.155 mm onto a screen 11.8 m away, creating a second-order dark fringe 5.72 cm from the central maximum. What colour is the light?

10 Monochromatic orange light of wavelength 602 nm is passed through a double slit of separation 0.108 mm onto a screen 6.27 m away. How far away from the central maximum is the second-order maximum?

Note: 3.4E4 = 3.4 x 10

Answers:

1. The light is orange (598 nm). 2. The screen is 5.2 m away. 3. The third-order nodal line is 1.85E-2 m away from the central maximum. 4. The slits are 0.143 mm apart. 5. The slits are 0.124 mm apart. 6. The light is green (537 nm). 7. The light is orange (608 nm). 8. The second-order maximum is 3.28E-2 m away from the central maximum. 9. The light is green (501 nm). 10. The second-order maximum is 6.99E-2 m away from the central maximum.