

Svar till exercises (FYSA01 vågrörelselära och optik)

14:

- E 7 a) 0.167 s b) 37.7 rad/s c) 0.0844 kg
E 9 a) 0.150 s b) 0.0750 s
E 24 0.377 m/s och -0.617 m/s²
E 27 a) 1.20 m/s b) ± 1.11 m/s c) 36 m/s² d) +13.5 m/s e) 0.360 J

15:

- E 6 a) 1.2 m/s b) 0.31 m c) amplitude becomes 0.15 m but the wavelength, period and wave speed are unchanged
E 8 a) 6.50 mm b) 28.0 cm c) 27.8 Hz d) 7.78 m/s e) +x-riktningen
E 19 a) 18.6 N b) 29.1 m/s
E 23 4.51 mm
E 40 a) 3.00 m 16.0 Hz b) 1.00 m 48.0 Hz c) 0.75 m 64.0 Hz
E 49 a) 311 m/s b) 246 Hz c) 245 Hz 1.40 m

16:

- E 15 a) $9.44 \cdot 10^{-11}$ m 0.434 m b) $5.66 \cdot 10^{-9}$ m 0.100 m
c) For a given frequency, the much less dense air molecules must have a larger amplitude to transfer the same amount of energy.
E 26 a) 0.290 m b) 1.16 m c) 297 Hz
E 36 1.00 m
E 40 16 Hz
E 45 a) 375 Hz b) 371 Hz c) 4 Hz
E 49 19.8 m/s
E 50 a) 302 Hz b) 228 Hz
E 55 a) 36.0° b) 2.23 s

33:

- E 12 a) 25.5° b) oberoende
E 13 a) - b) -
E 26 a) 1.36 och 1.40 b) 2.21 resp $2.15 \cdot 10^8$ m/s
E 43 72.0°
E 48 1.84
E 53 39.1°

34:

- E 5 b) +11.0 cm, +33.0 cm, -1.20 cm
E 6 b) -11.0 cm, -6.60 cm, -0.240 cm
E 19 a) -14.0 cm, +1.33 b) ingen fara
E 25 a) **+18.6 cm; +107 cm; -1.78 cm** b) samma
E 26 a) **-48.0 cm** b) **+2.55 cm** c) -
E 31 1.67
E 35 a) **+12.0 cm; +36.0 cm** b) **+20.0 cm; -180 cm** c) **-12.0 cm; -7.2 cm**
d) **-60.0 cm; -13.8 cm**
E 39 a) **+200 cm; -4.80 cm** b) **+150 cm; +7.20 cm**
E 40 a) **+200 cm; -4.80 cm; -37.5 cm; -1.80 cm**
b) **-22.2 cm; +0.533 cm; +73.7 cm; -0.122 cm**
c) **-22.2 cm; +0.533 cm; -50.6 cm; +0.0837 cm**
E 44 **8.69 cm; 3.90 cm**
E 53 a) 80.0 cm b) **76.9 cm**
E 54 a) **översynt** b) **positiva linser** c) **+56.25 cm; +1.78**
E 63 a) **8.37 mm** b) **-21.4** c) **-297**
E 64 **-19.0**
E 66 **0.0054°**

35:

E 9 1.14 mm
E 10 0.193 mm
E 11 0.83 mm
E 16 3.17 mm
E 25 114 nm
E 36 a) 0.248 mm och 0.205 mm b) 0.043 mm

36:

E 1 506 nm
E 4 5.90 mm
E 12 a) 10.9 mm b) 5.4 mm
E 15 a) 6.75 mm b) 2.43 $\mu\text{W}/\text{m}^2$
E 24 0.806 $\mu\text{W}/\text{m}^2$
E 29 a) 4790 ritsar per cm b) 19.1° och 40.8° c) nej
E 30 20.2°
E 37 a) 17500 b) ja c) 587.7834 nm < λ < 587.8170 nm
E 38 2752 ritsar per cm
E 47 1.45 m