

Physics 20

Period and Frequency Worksheet

REMEMBER TO USE PROPER SIG FIGS!!

Part A. Find frequency and period of the following:

1. A wave completes 30 cycles in 15 seconds.
 - a. frequency = $30/15\text{s} = 2\text{ Hz}$
 - b. period = $15\text{s}/30 = 0.5\text{ s}$
2. A slinky goes through 20.0 cycles in 5.0 seconds.
 - a. frequency = $20.0/5.0\text{s} = 4.0\text{ Hz}$
 - b. period = $5.0\text{s}/20.0 = 0.25\text{ s}$
3. A water wave is seen to have 80 crests in 20 seconds.
 - a. frequency = $80/20\text{s} = 4\text{ Hz}$
 - b. period = $20\text{s}/80 = 0.25\text{ s}$ round to 0.3 s
4. A fly flaps its wings back and forth 121 times in one second.
 - a. frequency = $121/1\text{s} = 121\text{ Hz}$
 - b. period = $1\text{s}/121 = 0.00826\text{ s}$
5. A wave completes 10 cycles in 2 minutes.
 - a. frequency = $10/120\text{s} = 0.08\text{ Hz}$
 - b. period = $120\text{s}/10 = 12\text{ s}$ round to 10 s
6. The second hand of a clock completes one cycle in one minute.
 - a. frequency = $1/60\text{s} = 0.0167\text{ Hz}$ round to 0.02 Hz
 - b. period = $60\text{s}/1 = 60\text{ s}$
7. A wave completes one cycle every 2 seconds.
 - a. frequency = $1/2\text{s} = 0.5\text{ Hz}$
 - b. period = $2\text{s}/1 = 2\text{ s}$
8. A wave completes 33 cycles in 11 seconds.
 - a. frequency = $33/11\text{s} = 3.0\text{ Hz}$
 - b. period = $11\text{s}/33 = 0.33\text{ s}$
9. A wave completes 40. cycles in 628 seconds.
 - a. frequency = $40/628\text{s} = 0.06369\text{ Hz}$ round to 0.064 Hz
 - b. period = $628\text{s}/40 = 15.7\text{ s}$ round to 16 s
10. A wave completes $\overline{200}$ cycles in 4.00 seconds.
 - a. frequency = $200/4.00\text{s} = 50.0\text{ Hz}$
 - b. period = $4.00\text{s}/200 = 0.0200\text{ s}$

Part B. Find the period of the following:

11. A wave has a frequency of 10 Hz.

a. $T = 1/f = 1/10 \text{ Hz} = 0.1 \text{ s}$

12. A wave has a frequency of 2 000 Hz.

a. $T = 1/f = 1/2000 \text{ Hz} = 0.0005 \text{ s}$

13. A wave has a frequency of 0.89 Hz.

a. $T = 1/f = 1/0.89 \text{ Hz} = 1.1 \text{ s}$

14. A wave has a frequency of 51.2 Hz.

a. $T = 1/f = 1/51.2 \text{ Hz} = 0.0195 \text{ s}$

15. A wave has a frequency of 400 Hz.

a. $T = 1/f = 1/400 \text{ Hz} = 0.003 \text{ s}$

16. A wave has a frequency of 262 Hz.

a. $T = 1/f = 1/262 \text{ Hz} = 0.00382 \text{ s}$

17. A wave has a frequency of $9.95 \times 10^7 \text{ Hz}$.

a. $T = 1/f = 1/10 \text{ Hz} = 1.01 \times 10^{-8} \text{ s}$

18. A wave has a frequency of 0.10 Hz.

a. $T = 1/f = 1/0.1 \text{ Hz} = 10 \text{ s}$

19. A wave has a frequency of 1600 Hz.

a. $T = 1/f = 1/1600 \text{ Hz} = 0.00063 \text{ s}$

20. A wave has a frequency of 108 Hz.

a. $T = 1/f = 1/108 \text{ Hz} = 0.00926 \text{ s}$

Part C. Find the frequency of the following:

21. A wave with a period of 120 s.

a. $f = 1/T = 1/120 \text{ s} = 0.0083 \text{ Hz}$

22. A wave with a period of 0.04 s.

a. $f = 1/T = 1/0.04 \text{ s} = 25 \text{ Hz}$

23. A wave with a period of 52 s.

a. $f = 1/T = 1/52 \text{ s} = 0.019 \text{ Hz}$

24. A wave with a period of 2.00 s.

a. $f = 1/T = 1/2.00 \text{ s} = 0.500 \text{ Hz}$

25. A wave with a period of 21 s.

a. $f = 1/T = 1/21 \text{ s} = 0.048 \text{ Hz}$

26. A wave with a period of 4.8 s.

a. $f = 1/T = 1/4.8 \text{ s} = 0.21 \text{ Hz}$

27. A wave with a period of 0.7 s.

a. $f = 1/T = 1/0.7 \text{ s} = 1 \text{ Hz}$

28. A wave with a period of 73 s.

a. $f = 1/T = 1/73 \text{ s} = 0.014 \text{ Hz}$

29. A wave with a period of 500 s.

a. $f = 1/T = 1/500 \text{ s} = 0.002 \text{ Hz}$

30. A wave with a period of 18 s.

a. $f = 1/T = 1/18 \text{ s} = 0.056 \text{ Hz}$

Part D. Thinking Critically

As frequency increases will the period of a wave increase or decrease? Explain.

As frequency increases the period will decrease because they are inversely related.

$T = 1/f$ so if f gets bigger then T must get smaller (dividing by a bigger number)