

Exercises 1.3

1. a. Make a table of the values of the sine function between $-\pi$ and 4π , using values of x similar to those in the examples.
- b. Plot the corresponding values on a graph.
- c. Connect the points plotted with a smooth curve.
2. a. Make a table of values of the cosine function between $-\pi$ and 4π .
- b. Plot the corresponding function values on a graph.
- c. Connect the points plotted with a smooth curve.

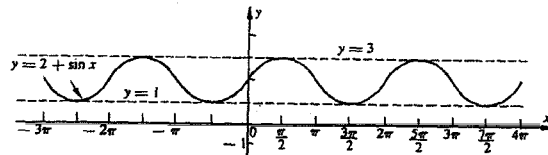
Make a rough sketch of the graphs of the following functions.

Example

$\{(x, y) \mid y = 2 + \sin x\}$.

Solution

The graph of $y = 2 + \sin x$ is between the lines $y = 1$ and $y = 3$, or occasionally on one or the other of the lines. The student may wish to construct a table of function values.



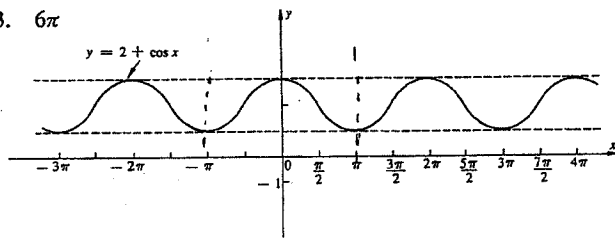
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|--|--|
| 1. $\{(x, y) \mid y = 2 + \cos x\}$ | 4. $\{(x, y) \mid y = \sin x - 1\}$ |
| 2. $\{(x, y) \mid y = \cos x - 3\}$ | 6. $\{(x, y) \mid y = 1 + \sin x\}$ |
| 7. $\{(x, y) \mid y = \frac{1}{2} + \sin x\}$ | 8. $\{(x, y) \mid y = \cos x - \frac{1}{2}\}$ |
9. The fundamental period of the sine function ($y = \sin x$) is 2π . What is the fundamental period of each of the following functions?
- | | | |
|-------------------------|------------------------------------|--|
| a. $\sin 3x$ | b. $\sin(-2x)$ | c. $\sin \frac{x}{2} = \frac{2}{2} = 1$ |
| d. $\sin \frac{3x}{4}$ | e. $\sin(-\frac{z}{3})$ | f. $\sin(-4z)$ |
10. The fundamental period of the cosine function ($y = \cos x$) is 2π . What is the fundamental period of each of the following functions?
- | | | |
|-----------------------------|-------------------|-----------------------------|
| a. $y = \cos 2x$ | b. $y = \cos 5x$ | c. $y = \cos(-\frac{x}{4})$ |
| d. $y = \cos \frac{3x}{2}$ | e. $y = \cos(-t)$ | f. $y = \cos(-3w)$ |

Attempt to sketch a graph of each of the following.

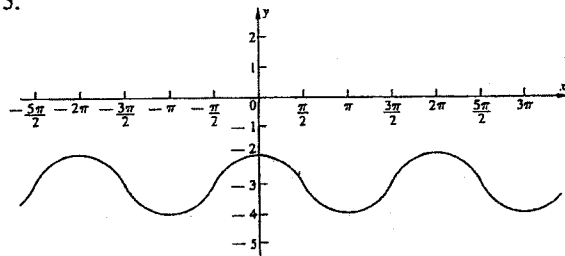
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|---|--|
| 11. $\{(x, y) \mid y = 2 \sin x\}$ | 12. $\{(x, y) \mid y = -\cos x\}$ |
| 13. $\{(x, y) \mid y = \cos 2x\}$ | 14. $\{(x, y) \mid y = \sin \frac{x}{2}\}$ |
| 15. $\{(x, y) \mid y = \sin(x + \frac{\pi}{2})\}$ | 16. $\{(x, y) \mid y = \cos(x + \pi)\}$ |

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3. 6π



5.



9. a. $\frac{2\pi}{3}$

c. 4π

e. 6π

11.

