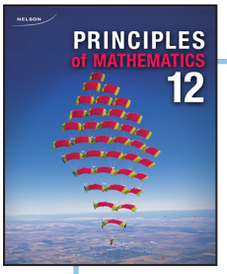


- If you have difficulty with these solutions, please contact your teacher before continuing.

Page 485, *Your Turn*

2π radians is 360° ✓ π radians is 180° ✓

Page 486, *Your Turn*

a. Using a benchmark of 1 radian = 60°, I estimate 120° to be about 2 radians. Because 1 radian is slightly less than 60°, 2 radians will be slightly less than 120°. My estimate is low. ✓

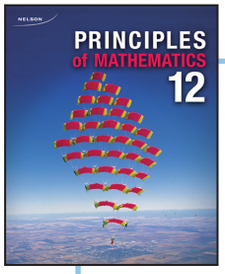
b. I know that 180° is π, or about 3.2 radians. Also, 45° is about 0.8 radians. Therefore, 135° will be about 2.4 radians. My estimate is slightly high, because I rounded π up to 3.2. ✓

Page 487, *Your Turn*

a. 420° is 60° more than 360°; therefore, 420° is about 1 + 6.3 = 7.3 radians. ✓

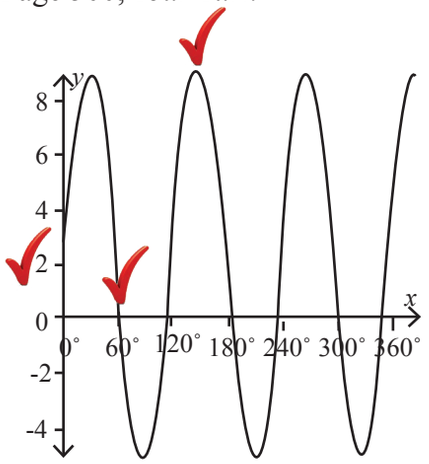
b. 495° is one revolution, plus one-quarter revolution, plus one-eighth revolution. In radians, one revolution is 2π or 6.3 radians. Thus, one-quarter revolution is about one-half π, or 1.6 radians. One-eighth is about 0.8 radians. Adding these values together, I get 8.7 radians. I know my estimate is high because the benchmarks I used are greater than the actual values. ✓

c. 660° = 720° – 60°; 720° is two revolutions, or 4π or about 1.25 radians, and 60° is about 1 radian. Thus, 660° is about 11.5 radians. I know my estimate is low, because 720° > 12.5 radians and 60° > 1 radian. ✓



- If you have any difficulty with these solutions, please contact your teacher before continuing.

Page 500, *Your Turn*



The graph represents a sine function with a domain of $\{x|\ 0° \le x \le 360°, x \in R\}$, a range of $\{y|\ -5 \le y \le 9, y \in R\}$, a period of 120°, and a y-intercept of 2.

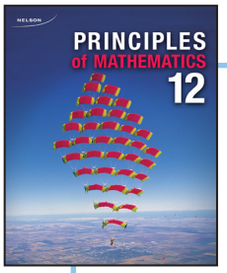
Page 501, *Your Turn*

range: $\{y|\ -1.5 \le y \le -0.5, y \in R\}$

amplitude: 0.5

period: 2

equation of the midline: $y = -1$



- If you have any difficulty with these solutions, please contact your teacher before continuing.

Page 503, *Your Turn*

a. The maximum value is 2.5 m, and the minimum value is 0.8 m. The range of the swing height is $\{y|\ 0.8 \le y \le 2.5, y \in R\}$. The amplitude is 0.85 m, the equation of the midline is $y = 1.65$, and the period is 2 s.

b. The swings are the same height at rest: 0.8 m. Lily swung 0.5 m higher on the second swing, and the time to make one full swing is 0.5 s longer.

Page 505, *Your Turn*

a. The amplitude of this graph is 14, and the period is about 1.35 s. Therefore, the radius of the tire is 14 in., which is 2 in. greater than the radius of the original tire. It takes 1.35 s to complete one revolution. So, this tire turns about 0.15 s slower than the tire in the example.

Page 519, *Your Turn*

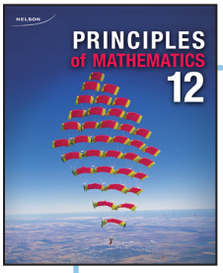
a. amplitude: 5

equation of the midline: $y = -3$

range: $\{y|\ -8 \le y \le 2, y \in R\}$

period: $\frac{360\Upsilon}{0.5} = 720\Upsilon$

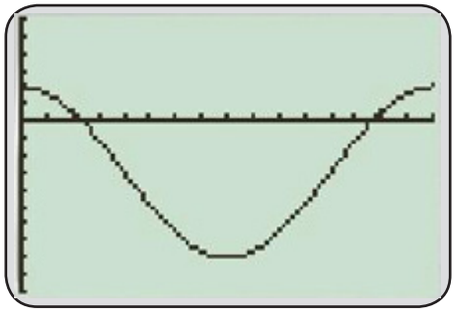
horizontal translation: The graph has not been translated horizontally.



- If you have any difficulty with these solutions, please contact your teacher before continuing.

b.

```
WINDOW
Xmin=0
Xmax=720
Xscl=45
Ymin=-10
Ymax=6
Yscl=1
Xres=1
```



Page 521, *Your Turn*

a. amplitude: 4

equation of the midline: $y = 0$

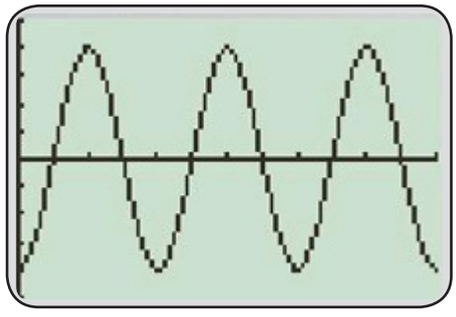
range: $\{y \mid -4 \le y \le 4, y \in R\}$

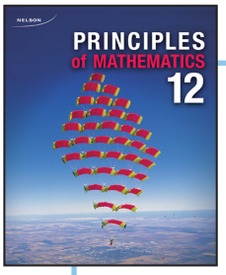
period: $\frac{360\Upsilon}{3} = 120\Upsilon$

horizontal translation: The graph is translated 60° to the right.

b.

```
WINDOW
Xmin=0
Xmax=360
Xscl=60
Ymin=-5
Ymax=5
Yscl=1
Xres=1
```





- If you have any difficulty with these solutions, please contact your teacher before continuing.

1.

Graph	Matching Equation	Reasoning	
A	iii.	$a = \frac{\max - \min}{2} = \frac{5-(-1)}{2} = \frac{6}{2} = 3$ $c = 160°$	$b = \frac{360\Upsilon}{\text{period}} = \frac{360\Upsilon}{180\Upsilon} = 2$ d = midline value = 2
B	i.	$a = \frac{\max - \min}{2} = \frac{4-(-2)}{2} = \frac{6}{2} = 3$ $c = -120°$	$b = \frac{360\Upsilon}{\text{period}} = \frac{360\Upsilon}{360\Upsilon} = 1$ d = midline value = 1
C	ii.	$a = \frac{\max - \min}{2} = \frac{1-(-5)}{2} = \frac{6}{2} = 3$ $c = 120°$	$b = \frac{360\Upsilon}{\text{period}} = \frac{360\Upsilon}{360\Upsilon} = 1$ d = midline value = –2
D	iv.	$a = \frac{\max - \min}{2} = \frac{1-(-3)}{2} = \frac{4}{2} = 2$ $c = 300°$	$b = \frac{360\Upsilon}{\text{period}} = \frac{360\Upsilon}{360\Upsilon} = 1$ d = midline value = –1

Page 526, *Your Turn*

9:22 a.m. is about 9.3667. The number of hours in the shortest day of the year is 4.34 (from textbook Example 4 – Solution (a)).

9.3667 + 4.34 = 13.707

0.707 × 60 minutes = 42.42

13.707 is equivalent to 13 hours and 42.42 minutes.

The sun sets at 13:42 on the 24-hour clock, which also can be written as 1:42 p.m.