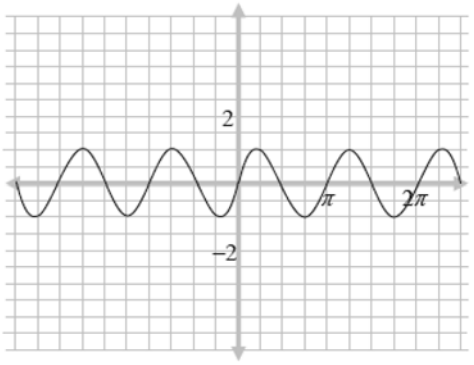
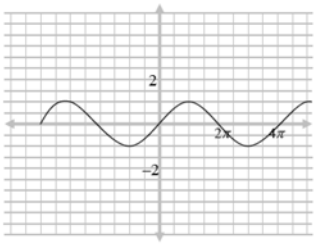
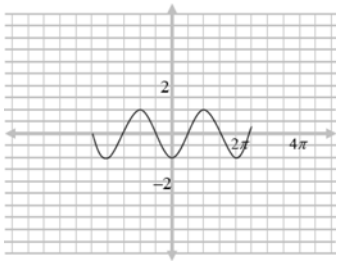
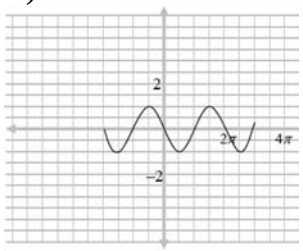
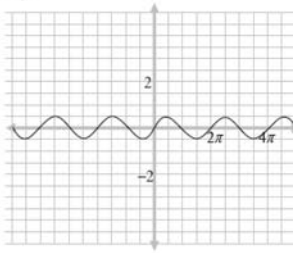
Sinusoidal Functions: Chapter 8

Practice Questions	**Notes**
1. The graph of a sinusoidal function is shown.  Compared to the graph of $y = \sin x$, the given graph differs only in: A) period. B) phase shift. C) amplitude. D) vertical displacement.	A
2. Which of the following functions has a median value of 4? A) $y = 4\sin(2x + 1) – 5$ B) $y = 2\sin(x – 5) + 4$ C) $y = \sin(5x + 4) + 2$ D) $y = –5\sin(4x + 2) + 1$	B

Try the Applet to investigate sin parameters:
Click here (https://www.geogebra.org/m/BxGBHbGV) to open the a*pplet Sinusoidal Function Parameters*.

3. Which of following functions has the largest maximum value? A) $y = 3\sin(4x + 3) + 1$ B) $y = 2\sin(2x + 1) + 2$ C) $y = -3\sin(2x + 1) + 4$ D) $y = -2\sin(5x - 3) + 6$	D
4. The graph of which of the following functions corresponds to $y = -\cos x$? A)  B)  C)  D)  	B

5. The average daily temperature of Montreal, in °F, for each of the months of the year is shown in the table below. January is month 1, February is month 2, etc.

Month	Average Daily High Temperature in °F	Month	Average Daily High Temperature in °F
1	22	7	80
2	25	8	77
3	36	9	67
4	52	10	51
5	66	11	41
6	75	12	28

The data cane be modelled by an equation in the form $y = a\sin(bx) + d$, where x is the month number and y is the average daily high temperature. To the nearest hundredth, the value of a is _____, b is _____,c is _____, and d is _____.

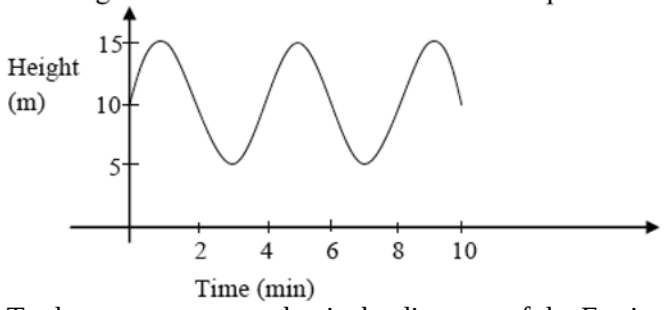
If scientists predict that the average daily temperature in °F will increase by 1.2 °F each month, what characteristic of the graph of the sinusoidal regression function would change?
A. amplitude
B. median value
C. period
D. phase shift

a = 29.08
b = 0.51
c = -2.02
d = 50.77

B

SE

6. The height of a Ferris wheel at a carnival is represented in the graph provided.



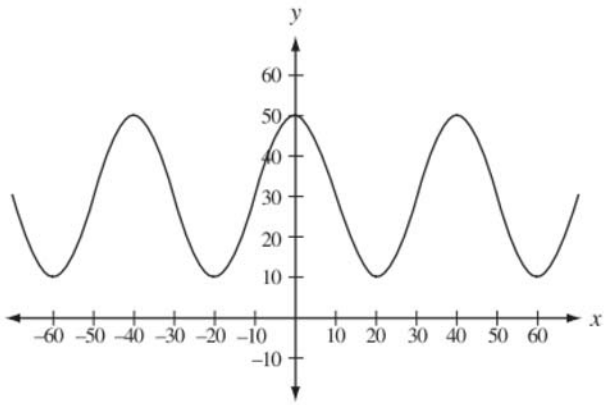
To the nearest metre, what is the diameter of the Ferris wheel? _____

10

7. The time of sunrise in a Maritime city is given by the equation above, where n is the nth day of the year and t is the time after midnight, in hours. $t = 1.89\sin(0.017n - 1.377) + 6.41$ If John leaves for work at 7:45 am, for how many days in the year will he leave before the sun rises? A) 92 B) 116 C) 249 D) 273 At what time will the sun rise on October 22 (day 295)? A) 7:02am B) 6:37am C) 5:51am D) 5 : 31am	A D
8. The height above the ground of a rider on a Ferris wheel can be modelled by the sinusoidal regression function $h = 6\sin(1.05t - 1.57) + 8$ where h is the height of the rider above the ground, in metres, and t is the time, in minutes, after the ride starts. According to the sinusoidal regression function, the maximum height of the rider above the ground is **A.** 2 m **B.** 6 m **C.** 8 m **D.** 14 m When the rider is at least 11.5 m above the ground, she can see the rodeo grounds. During each rotation of the Ferris wheel, the length of time that the rider can see the rodeo grounds, to the nearest tenth of a minute, is _____ min.	D 1.8 min

9.

The graph of a sinusoidal function is shown below.



The amplitude of the sinusoidal function is ___**i**___ *units and the median is* ___**ii**___ *units.*

i. 20
ii. 30

10.

The height of a pendulum, h, in inches, above a table top t seconds after the pendulum is released can be modelled by the sinusoidal regression function

$$h = 2\sin(3.14t - 1) + 5$$

The height of the pendulum at the moment of release, to the nearest tenth of an inch, is _____ in.

3.3 in