

Review

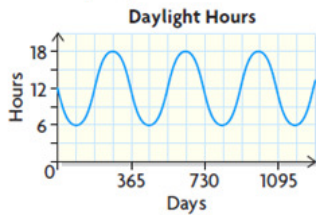
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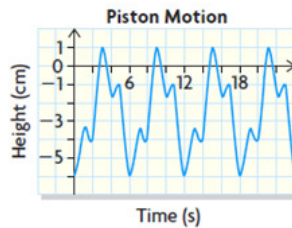
used review/random Quest.

① Determine whether the term *periodic* can be used to describe the graph for each situation.

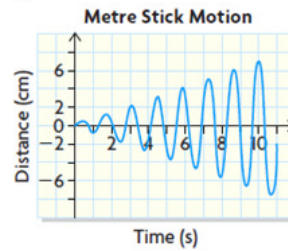
a) the average number of hours of daylight over a three-year period



b) the motion of a piston on an automated assembly line



c) a student is moving a metre stick back and forth with progressively larger movements



For periodic ones find i) period
ii) equation of axis
iii) amplitude
iv) range

② $y = 3\cos(4x + 36)$ - 2 represents height in meters of a bucket on a water wheel at x seconds

- How long does it take for the wheel to make one revolution?
- What is the radius of the wheel?
- Where is the centre of wheel located?
- Sketch + label all 5 pts of the cycle.

3.) Find equation using cosine, if possible

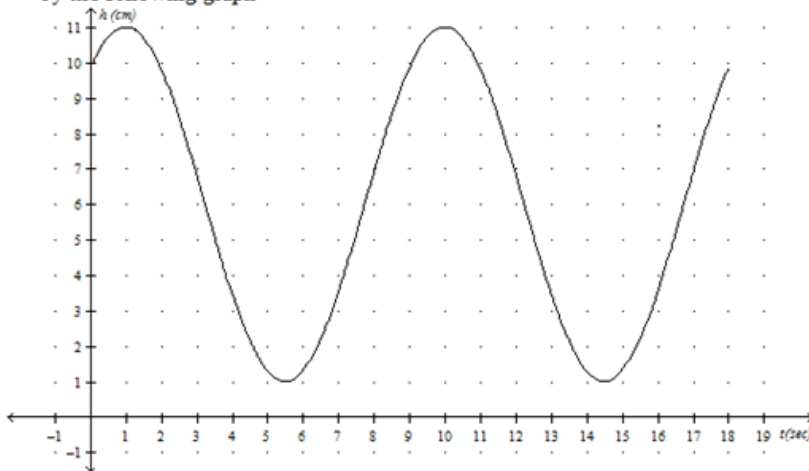
a)

x	y
-5	9
-4	6.75
-3	2.25
-2	0
-1	2.25
0	6.75
1	9

b)

x	y
1	5
2	6
4	5
7	6
11	5
16	6
22	5
29	6

4.) A spring bounces up and down. Its height above the tabletop in terms of time can be represented by the following graph



a) write an equation that will represent this using cosine function.

b) use the equation to find the height at 23sec.

c) use the equation to find ^{the} one time when the height is 9cm. Record result in general

5.) A bicycle tire with a diameter of 80cm and that rotates once every 2 sec.

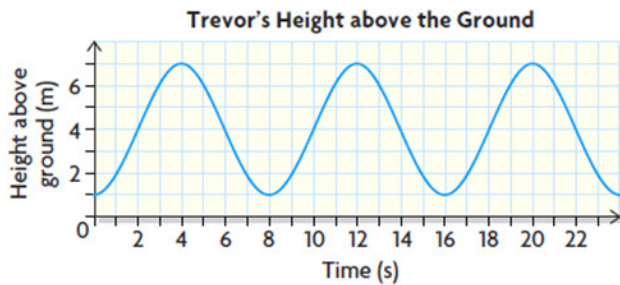
a) Sketch one cycle + label 5 points

b) Find equation assume starts at MAX.

c) Find the speed of the bicycle in km/h.

6)

While riding on a Ferris wheel, Trevor's height above the ground in terms of time can be represented by the graph shown.



- What is the period of this function, and what does it represent?
- What is the equation of the axis? what does it represent?
- What is the amplitude + what does it represent?
- Find equation
- Sketch a height versus distance travelled by Trevor.
- Find the speed
- Convert speed to Km/hr

7)

The diameter of a car's tire is 60 cm. While the car is being driven, the tire picks up a nail.

- If the speed was 50 Km/h draw a sketch of the height versus time for 1 sec.
- Find equation for height versus time.
- Sketch one cycle of height versus distance travelled
- Find equation for height versus distance

8)

Each person's blood pressure is different. But there is a range of blood pressure values that is considered healthy. For a person at rest, the function $P(t) = -20 \cos(300t)^\circ + 100$ models the blood pressure, $P(t)$, in millimetres of mercury at time t seconds.

- What is the period of the function? What does the period represent for an individual?
- What is the range of the function? Explain the meaning of the range in terms of a person's blood pressure.
- Determine the pressure at 2 sec.
- Find the time(s) at which pressure is 110 mm

* (1.) Sketch one cycle + label 5 key values

a) $f(x) = 1 - \frac{1}{2} \sin\left(3x + \frac{\pi}{4}\right)$

b) $y = 2 \tan\left(x + \frac{\pi}{3}\right) + 4$

c) $y = 2 \cot \frac{\pi}{4} x - 1$

d) $y = \frac{1}{2} \csc(2x - \pi) + 5$

e) $y = \sec \frac{\pi}{8} x - 2$

f) $y = |\cos(\pi x)|$

g) $y = |\sin x| + 2$

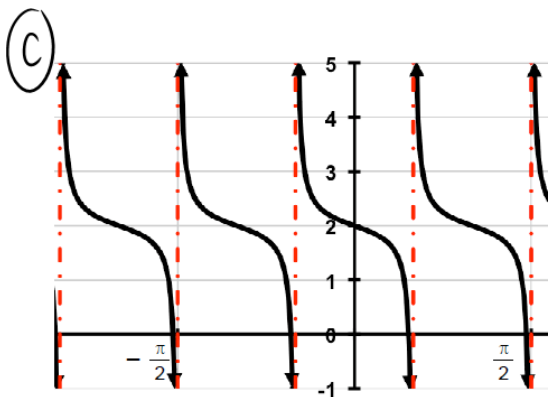
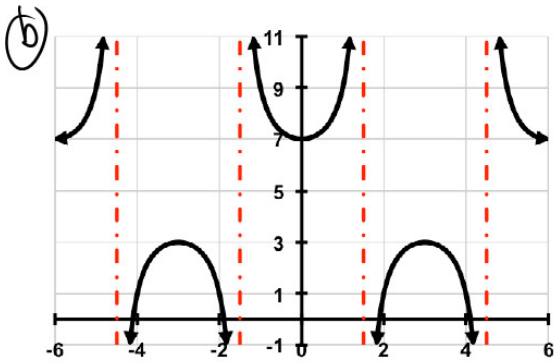
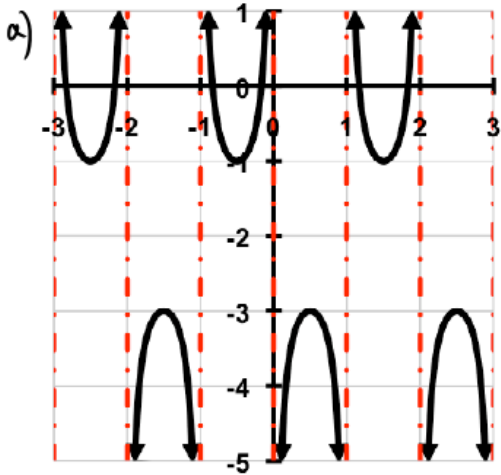
h) state domain + range for each sketch above

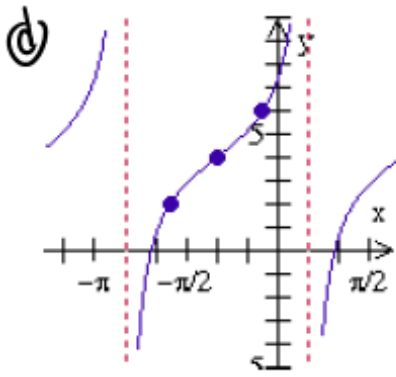
* (2) At one time, Maple Leaf Village (which no longer exists) had North America's largest Ferris wheel. The Ferris wheel had a diameter of 56 m, and one revolution took 2.5 min to complete. Riders could see Niagara Falls if they were higher than 50 m above the ground. Sketch three cycles of a graph that represents the height of a rider above the ground, as a function of time, if the rider gets on at a height of 0.5 m at $t = 0$ min. Then determine the time intervals when the rider could see Niagara Falls.

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do all calculations in radians

* ③ Find 2 different equations for each using different trig name.





* 4 Simplify

a) $\arctan\left(\tan\frac{3\pi}{4}\right)$

b) $\arcsin\left(\sin\frac{7\pi}{6}\right)$

c) $\operatorname{arccsc}\frac{2\sqrt{3}}{3}$

d) $\operatorname{arccot} 0$

e) $\csc(\arctan 3)$

f) $\tan\left(\arcsin\frac{-12}{13}\right)$

g) $\cot(\operatorname{arccsc} x)$

h) $-\csc^2(\cot^{-1} x)$