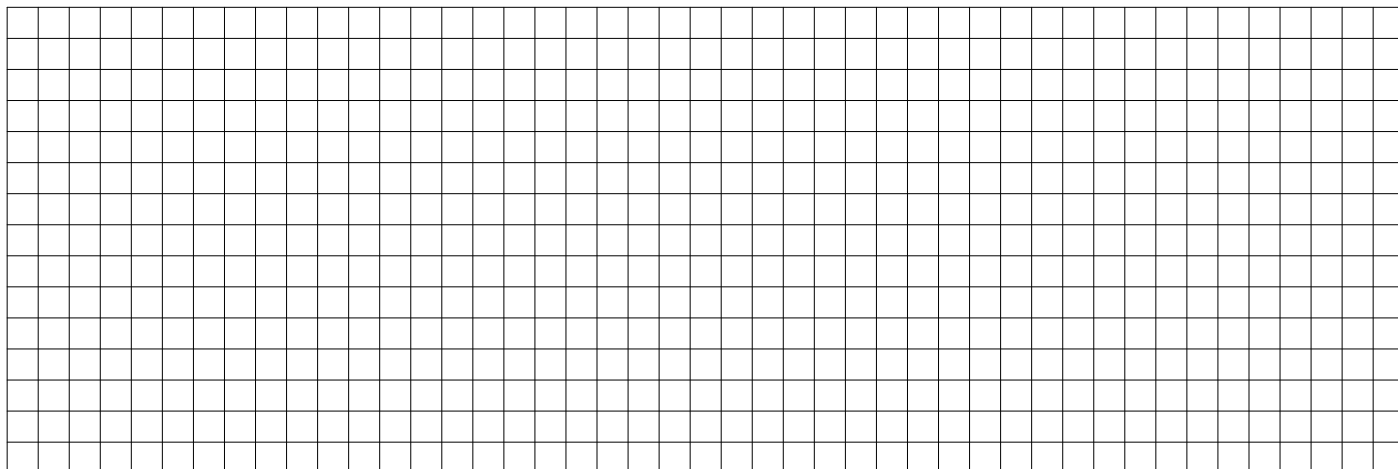


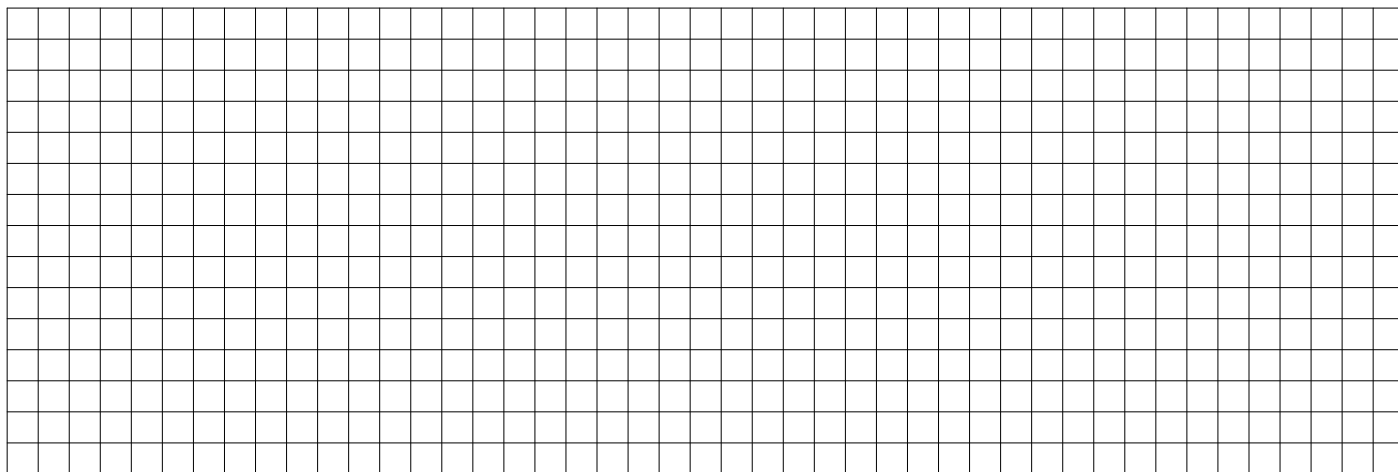
(Do not use your calculator on this page please.)

Sketch a graph of each of the following functions.

1.  $y = -2\sin(3x) - 2$



2.  $y = 0.5\sin(\pi x/2) + 1.5$

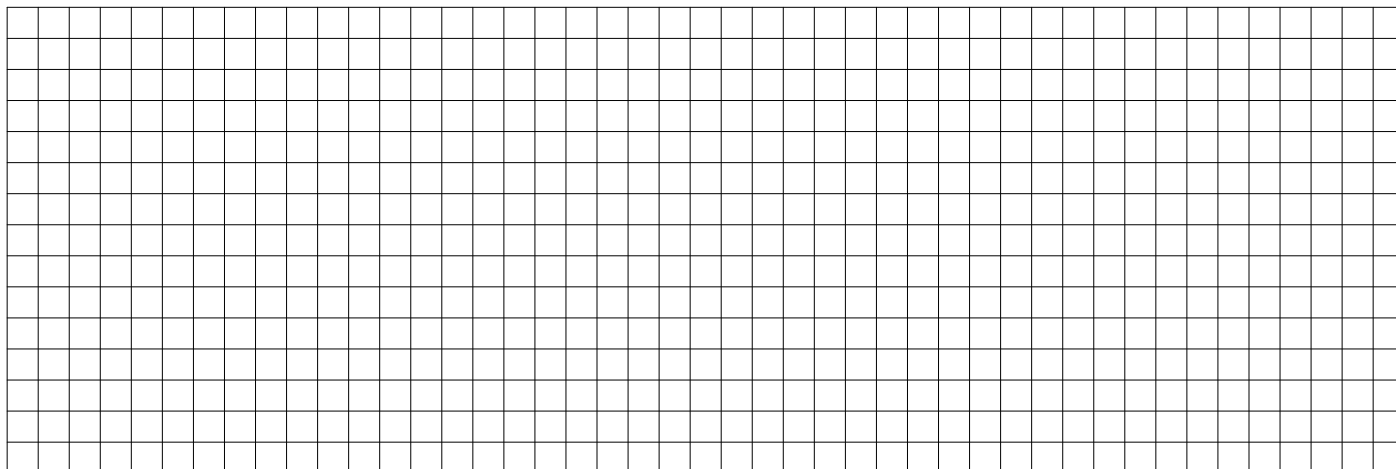


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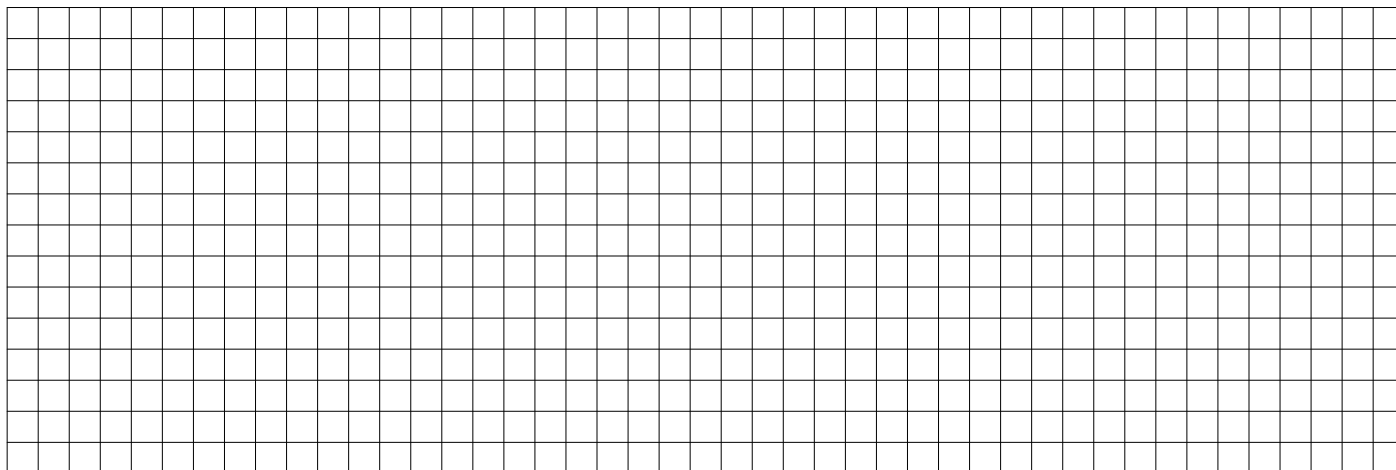
(Do not use your calculator on this page please.)

Sketch a graph of each of the following functions.

3.  $y = -\text{Cos}(2x + 1)$



4.  $y = 3\text{Cos}(x/3) + 3$



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(Do not use your calculator on this section please.)

Find the exact value of each of the following.

5.  $\cos(\arcsin(0.2)) =$  \_\_\_\_\_

6.  $\tan(\arcsin(-0.6)) =$  \_\_\_\_\_

7.  $\cot(\arccos(1/3)) =$  \_\_\_\_\_

8.  $\sin(\arctan(2)) =$  \_\_\_\_\_

(You will need to use your calculator on this section.)

Solve each of the following problems. Express solutions rounded to three significant figures.

9. A ladder that is 12 feet long is leaning against a vertical wall. If the ladder makes an angle of 65 degrees with the level ground, then how far is the foot of the ladder from the wall?

(You will need to use your calculator on this page.)

Solve each of the following problems. Express solutions rounded to three significant figures.

10. A vertical poll that is 15 feet tall casts a shadow on level ground. If the shadow is 10 feet long, then what is the angle of elevation to the sun?

11. A simple harmonic motion is described by the function  $d = -2\cos(10\pi t)$ . What is the frequency? (Assume that the time  $t$  is expressed in seconds.)

12. An airplane takes off from a runway making an angle of  $12^\circ$  with the level ground. If the plane is moving at 150 miles per hour, then how many feet above the ground is it after 20 seconds?

(You will need to use your calculator on this page.)

Solve each of the following problems. Express solutions rounded to three significant figures.

13. A passenger in an airplane flying at a height of 5,000 feet sees two towns directly to the left of the plane. The angles of depression to the towns are  $25^\circ$  and  $72^\circ$ . How many miles apart are the towns?

14. A regular nonagon is inscribed in a circle with a 5 inch diameter. What is the length of each side of the nonagon?