

Honors Precalculus BC Summer Work 2021

The following problems are to be completed upon entering Honors Precalculus. Your solutions for each problem should be clear, containing complete sentences explaining your solving process where applicable. Please put each solution on a separate page. The first day of school will be spent discussing and presenting solutions to these problems and you will be expected to participate.

1. Which point on the circle $x^2 + y^2 - 12x - 4y = 50$ is closest to the origin? Which point is farthest from the origin? Explain.

2. Simplify the following expressions without parenthesis.

a) $(xy)^2$

b) $(x + y)^2$

c) $(a \sin B)^2$

d) $(a + \sin B)^2$

3. Two different points on the line $y = 2$ are each exactly 13 units from the point $(7, 14)$. Draw a picture of this situation and then find the coordinates of these points.

4. Pat races at 10 miles per hour, while Kim races at 9 miles per hour. When they both ran in the same long-distance race last week, Pat finished 8 minutes ahead of Kim. What was the length of the race, in miles? Describe your reasoning clearly.

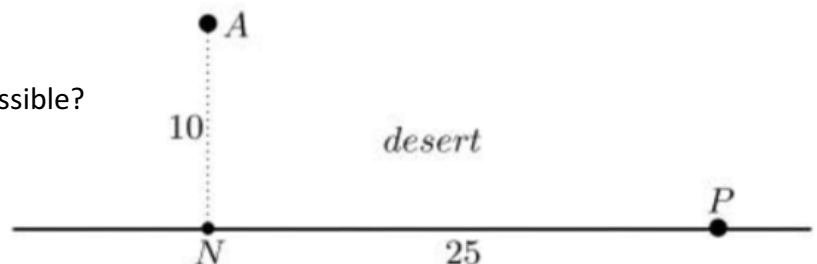
5. A debt of \$450 is to be shared equally among the members of a club. When 5 of the members refuse to pay, the other members' shares go up \$3. How many members does the club have?

6. Alex the geologist is in the desert, 10 km from a long, straight road. On the road, Alex's jeep can do 50 kph, but on the sand it can only do 30 kph. Alex wants to get point P, and the closest point on the road to Alex is point N, which is 25 km from point P.

a) How many minutes will it take Alex to drive to point P through the desert?

b) Would it be faster if Alex drove straight to N then straight along the road to P? Explain clearly.

c) Find a faster route to P. Is it the fastest possible?



7. Find a point on the line $x + 2y = 8$ that is equidistant from the points $(3, 8)$ and $(9, 6)$.

8. How large a square can be put inside a right triangle whose legs are 5 cm and 12 cm?