

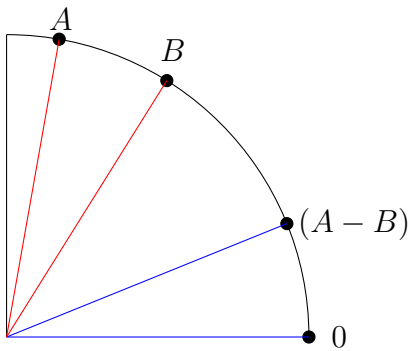
Trigonometry

Activity 3b - Angle Sum Formulas Part I

1. Find the following distances:

- Find the distance between $(4, 0)$ and $(-2, 0)$
- Find the distance between $(4, 3)$ and $(-2, 3)$
- Find the distance between $(4, 3)$ and $(4, 6)$
- Find the distance between $(-2, 3)$ and $(4, 6)$
- Find the distance between $(-2, 3)$ and (h, k)
- Find the distance between (x, y) and (h, k)

2. Let A and B be first quadrant angles with $A > B > (A - B) > 0$.



- In the picture above, label the x - and y -coordinates of the points associated with A , B , $A - B$, and 0 .
(Hint: the ordered pair for the angle 0 is $(1, 0)$, from the unit circle. The others will involve \sin and \cos .)
- Find a formula for the distance between the points associated with angles A and B .
- Find a formula for the distance between the points associated with angles $(A - B)$ and 0 .
- Explain why the distances found in part b) and part c) are the same.
- Set the distances in part b) and part c) equal to each other and simplify. Your result should be a formula for $\cos(A - B)$.

3. Let $C = -B$

That is, let C be the point on the unit circle in the fourth quadrant which has the same x -coordinate of B , but the opposite y -coordinate so that $C = -B$. The angle $A - C$ will be used in the formulas, but it is somewhat difficult to visualize.

- How does $\cos(C)$ relate to $\cos(B)$? How does $\sin(C)$ relate to $\sin(B)$?
- Using your answer to 2e) write the formula for $\cos(A - C)$.
- In 3a) replace C with $-B$.
- Using 3b), simplify the equation in 3c). Your result should be a formula for $\cos(A + B)$.