

S.M.ART School Homework for MCB4 due 10-04-2023

Q1 Point Y lies between X and Z on a line, such that $XY = XZ/3$. In terms of XY, what is YZ?

- A) $XY / 3$
- B) $XY / 2$
- C) XY
- D) $2 * XY$
- E) $3 * XY$

Q2 If $y = (x - 1) / (x+1)$, then what is x in terms of y?

Q3 $x - y = \sqrt{7}$; $x*y = 2$. How much is $|x + y|$?

Q4 A man drove a boat upstream from one place to another for 4 hours. A return trip took him 1 hour. If the speed of the river is 2 mph, then find the distance between the places.

Q5

In a deck of cards, there is a ratio of 4 to 3 for spades to clubs. Which of the following statements about the number of spades and clubs must be true?

- (A) Their sum is an odd number.
- (B) Their sum is an even number.
- (C) Their product is a multiple of 5.
- (D) Their product is a multiple of 12.
- (E) Their product is a multiple of 36.

Q6

If A is point $(-4,1)$ and B is point $(2,1)$, what is the area of the circle that has \overline{AB} as a diameter?

- (A) 3π
- (B) 6π
- (C) 9π
- (D) 12π
- (E) 36π

Q7

Let P and Q be points 2 inches apart, and let A be the area, in square inches, of a circle that passes through P and Q . Which of the following is the set of all possible values of A ?

- (A) $0 < A$
- (B) $0 < A \leq \pi$
- (C) $A = \pi$
- (D) $A > \pi$
- (E) $A \geq \pi$

Make sure you understand how we proved the following inequality in class

D1 If $x \geq 0$ and $y \geq 0$, then $(x + y) \geq \sqrt{x*y}$

D2 Prove that $\sqrt{a*b} \geq 2*a*b / (a + b)$, if $a*b > 0$

D3 Prove that $(a^2 + 4) / \sqrt{a^2 + 3} \geq 2$

D4 Prove that if $a > b > 1$, then
 $a^2*b + b^2 + a > b^2*a + a^2 + b$

P1 Determine coefficients a , b and c of a parabola $y = a*x^2 + b*x + c$,
if this parabola contains points $A(1, -2)$, $B(0, 6)$, $C(-2, 1)$.

S1 Solve a system

$$\begin{cases} |x| + y = 2, \\ 3x + y = 4; \end{cases}$$