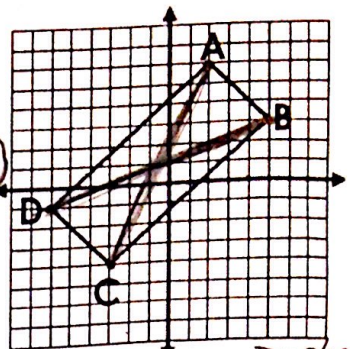


8. The following shape is a rectangle.

AB, DC
AD, BC

a) Prove that it's a parallelogram using the distances and slopes.

$A(2, 6) B(5, 3) C(-3, -4) D(-6, -1)$ $\frac{7}{8} = \frac{7}{8}$
 $AB = \frac{3-6}{5-2} = \frac{-3}{3} = -1$ $DC = \frac{-1-(-4)}{-6-(-3)} = \frac{3}{-3} = -1$ $DA = \frac{-1-6}{-6-2} = \frac{-7}{-8} = \frac{7}{8}$ $BC = \frac{3+4}{5+3} = \frac{7}{8}$



b) The diagonals of a rhombus are perpendicular. Find the slopes of the diagonals to prove that it's not a rhombus.

$AC = \frac{6+4}{2+3} = \frac{10}{5} = 2$ $DB = \frac{3+1}{5+6} = \frac{4}{11}$ not perp.

$A = 10 \cdot 6 \cdot 4 \cdot 2 = 44.52$ $P = 2(10 \cdot 6) + 2(4 \cdot 2)$
 $P = 29.6$

c) Find the perimeter and area of the rectangle.

$DC = \sqrt{(-3+6)^2 + (-4+1)^2} = \sqrt{3^2 + (-3)^2} = \sqrt{18}$ $DA = \sqrt{(-6-2)^2 + (-1-6)^2} = \sqrt{8^2 + 7^2} = \sqrt{113}$

9. Find the midpoint of the points.

a. $(-5, 3) (2, 6)$ $\frac{-5+2}{2} = -\frac{3}{2}$ $\frac{3+6}{2} = \frac{9}{2}$
 $(-\frac{3}{2}, \frac{9}{2})$

b. $(3, -2) (-1, 5)$ $(1, \frac{3}{2})$
 $\frac{3-1}{2} = \frac{2}{2} = 1$ $\frac{-2+5}{2} = \frac{3}{2}$

10. Find the coordinates of the other endpoint of a segment with an endpoint of $(-1, 5)$ and a midpoint $(2, -3)$.

$(-1, 5)$ $(2, -3)$ $(5, -11)$
 Start Mid New End
 $x+3$ $y-8$

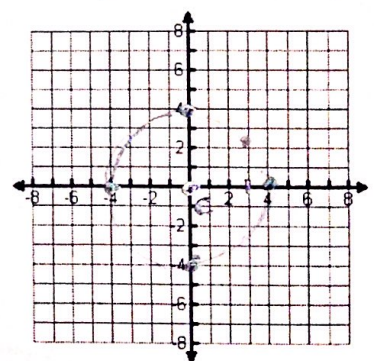
11. Josh and Drake decide to play catch after school. They start at the same point. Josh walks 50 feet north and 20 feet west. Drake walks 40 feet south and 10 feet east. How far apart are they?

$\sqrt{(10+20)^2 + (40-50)^2}$
 $\sqrt{30^2 + 90^2} = \sqrt{9000} = 94.9$ ft apart

12. Determine whether Point A lies on the circle whose center is Point C and which contains the Point P(0, 4). Justify your answer algebraically showing work.

Point A(3, $\sqrt{7}$); Point C(0, 0); Point P(0, 4)

$(3-0)^2 + (\sqrt{7}-0)^2 = 16$
 $9 + 7 = 16$ yes



13. Find the equation of the line that is parallel to $y = 2x + 8$ that passes through $(-6, 1)$.

$y = 2x + b$ $1 = 2(-6) + b$ $1 = -12 + b$ $13 = b$ $y = 2x + 13$

14. Find the equation of the line that is perpendicular to $y = 3x + 1$ that passes through $(3, 4)$.

$y = -\frac{1}{3}x + b$ $4 = -\frac{1}{3}(3) + b$ $5 = b$

15. Find the coordinates of point T so that it partitions AB into a ratio of 1:3.

A(-8, -1) and B(12, 11)

$T = (-4, 2)$

$x = (12+8) \cdot \frac{1}{4} + -8$ $y = (11+1) \cdot \frac{1}{4} + -1$
 $\frac{16}{4} + -8$ $4-8 = -4$ $3-1$