**Unit 1 Study Guide** Name Key S ___

Use points $P(2,-1)$ & $Q(-9,-6)$ for #1 & 2.

* 1) What coordinate point partitions the directed line segment $\overline{PQ}$ by a ratio $\frac{3}{2}$?

$\Delta x \Rightarrow 2 - -9 = 11\ (3/5) = 33/5 = 6.6$

$\Delta y \Rightarrow -1 - -6 = 5\ (3/5) = 15/5 = 9.5/3$

$x \Rightarrow 2 - 6.6 = -4.6$

$y \Rightarrow -1 - 3 = -4$

$(-4.6, -4)$

2) What coordinate point partitions the directed line segment $\overline{QP}$ by a ratio $\frac{2}{3}$?

$\Delta x \Rightarrow -9 - 2 = -11\ (2/5) = -22/5 = -4\ 2/5$

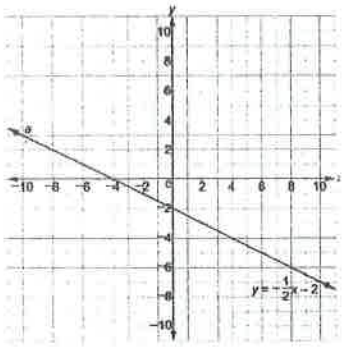
$\Delta y \Rightarrow -6 - -1 = -5\ (2/5) = -2$

$x \Rightarrow -9 + 4.4 = -4.6$

$y \Rightarrow -6 + 2 = -4$

$(-4.6, -4)$

3) An equation of a **line a** is $y = -\frac{1}{2}x - 2$. **See graph.**




$m_1 = -\frac{1}{2}$

$m_2 = +2$

What is the equation of the line that is perpendicular to line a shown on the graph and passes through point $(-4, 0)$.

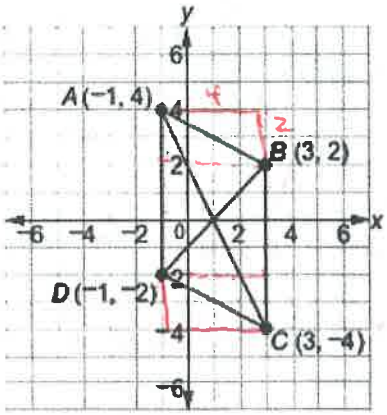
$y - y_1 = m_2(x - x_1)$

$y - 0 = 2(x - -4)$

$y = 2(x + 4)$

$y = 2x + 8$

***Parallelogram ABCD at right has vertices as shown.***




4) What is the perimeter of ABCD?

$\overline{AB} = 2\sqrt{5} = 4.5$ $\quad 2^2 + 4^2 = 4 + 16 = \sqrt{20}$

$\overline{BC} = 6$

$\overline{CD} = 2\sqrt{5} = 4.5$

$\overline{AD} = 6$

$12 + 4\sqrt{5}$ or 21

5) What is the length of each diagonal?

$\overline{AC} = \sqrt{(4 - -4)^2 + (-1 - 3)^2} = \sqrt{8^2 + (-4)^2} = \sqrt{64 + 16} = \sqrt{80}$

$4\sqrt{5}$ or 8.9

$\overline{BD} = \sqrt{(2 - -2)^2 + (3 - -1)^2} = \sqrt{4^2 + 4^2} = \sqrt{32}$

$4\sqrt{2}$ or 5.7

6) What is the area of the parallelogram? Area = bh

$A = bh$

$A = (6)(4)$

$A = 24$ sq units

***Write the equation of the lines below in slope-intercept form: $y = mx + b$.***

7) Through $(-4, 5)$ and parallel to $y = -\frac{3}{2}x - 5$.

$m_1 = -3/2$

$m_2 = -3/2$

$(y - y_1) = m(x - x_1)$

$y - 5 = -3/2(x - -4)$

$y - 5 = -3/2(x + 4)$

$y - 5 = -3/2x - 6$

$y = -3/2x - 1$

8) Through $(4, 1)$ and perpendicular to $y = -2x - 2$

$m_1 = -2$

$m_2 = 1/2$

$y - y_1 = m(x - x_1)$

$y - 1 = 1/2(x - 4)$

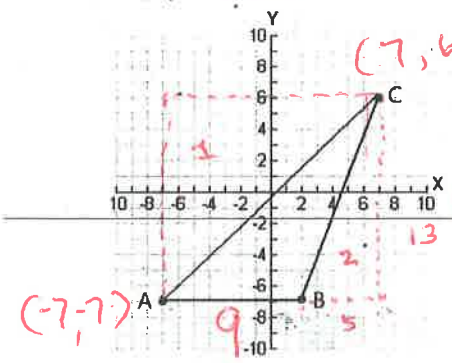
$y - 1 = \frac{1}{2}x - 2$

$+1 \quad +1$

$y = \frac{1}{2}x - 1$

***Find the area and perimeter of the following triangle. Simplest form required. Reminder: Draw altitude to find height.***

9 Area = 58.5 Perimeter = 42 units




Altitude = 13

$A = 13(9) = 117$

$A = 117/2 =$ 58.5

$\overline{AB} = 9$

$\overline{BC} = 13.9$ $\quad 5^2 + 13^2 = c^2$

$\overline{AC} = \sqrt{(-7-6)^2 + (-7-7)^2}$

$= \sqrt{(-13)^2 + (-14)^2}$

$= \sqrt{169 + 196} = \sqrt{365} = 19.1$

$P = 9 + 13.9 + 19.1 = 42$

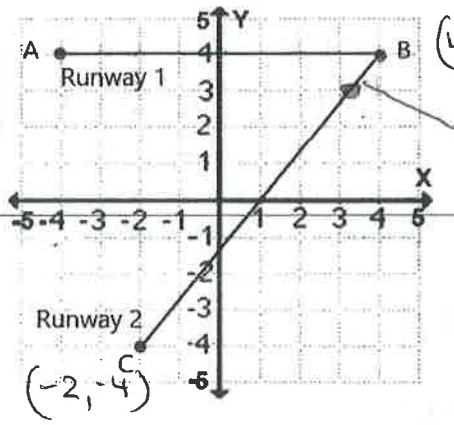
Area $= (14)(13) = 182$ sq units

$A_1 = 182/2 = 91$ sq units

$A_2 = 5(13) = 65/2 = 32.5$ sq

Area $= 182 - 91 - 32.5 = 58.5$ sq units

10) 4428 yards




$\overline{AB} = 8$ units $\times$ 200 yd

$= 1600$ yds

$\overline{BC} = \sqrt{(4 - -4)^2 + (4 - -2)^2}$

$= \sqrt{8^2 + 6^2}$

$= \sqrt{64 + 36}$

$= \sqrt{100} = 10$ units

So, $10 \times \frac{2828}{200} = \frac{2828}{2000}$ yd

Thus, $1600 + \frac{2828}{2000} = \frac{4428}{3600}$ yds