Objective CHECK DEAL OR NO DEAL!

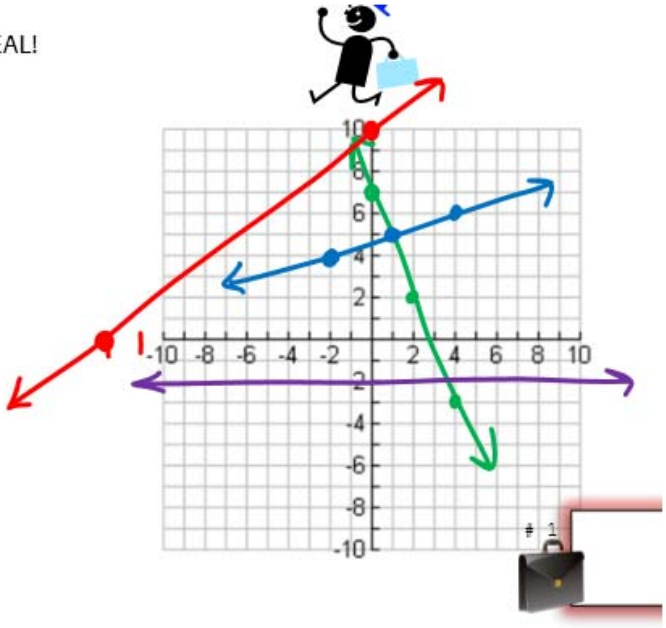
Objective 1: Graph a line from any form

a. Graph $y=-\frac{5}{2}x+7$

b. Graph $5x-6y=-60$

c. Graph $y-4=\frac{1}{3}(x+2)$

d. $y=-2$



Objective 2: Write the equation of a line

a. Write the equation of the line through (-2,3) and (8,-5).

$m=\frac{-5-3}{8--2}=\frac{-8}{10}=-\frac{4}{5}$

$y+5=-\frac{4}{5}(x-8)$ or $y-3=-\frac{4}{5}(x+2)$

b. Write the equation of the line perpendicular to $5x-6y=-60$ and through (-4,17).

$m=\frac{5}{6}$ $y-17=-\frac{6}{5}(x+4)$

c. Write the equation of the line parallel to $y-4=\frac{1}{3}(x+2)$ and through the x-intercept of $5x-6y=-60$.

$y-0=\frac{1}{3}(x+12)$ $(-12,0)$

Objective 3: Solve a system that has multiple solutions

Solve for x and y:

$\begin{cases}(x-3)^2+(y+5)^2=49\\ y=3x-4\end{cases}$

$(x-3)^2+(3x-4+5)^2=49$

$x^2-6x+9+9x^2+6x+1=49$

$10x^2+10=49$

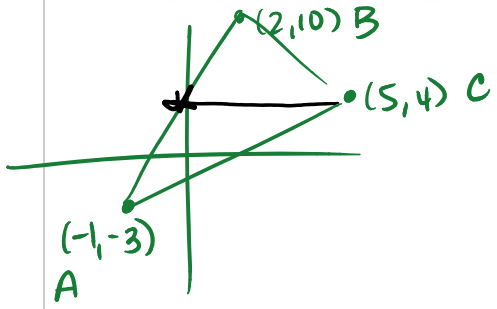
$10x^2=39$

$x^2=\frac{39}{10}$

$\left(+\frac{\sqrt{390}}{10}, \frac{3\sqrt{390}}{10}-4\right)$

$\left(-\frac{\sqrt{390}}{10}, -\frac{3\sqrt{390}}{10}-4\right)$

Objective 4: Write an equation of a median in a triangle:
Triangle ABC has coordinates A(-1,-3), B(2,10), and C(5,4). Write an equation for the median from C.

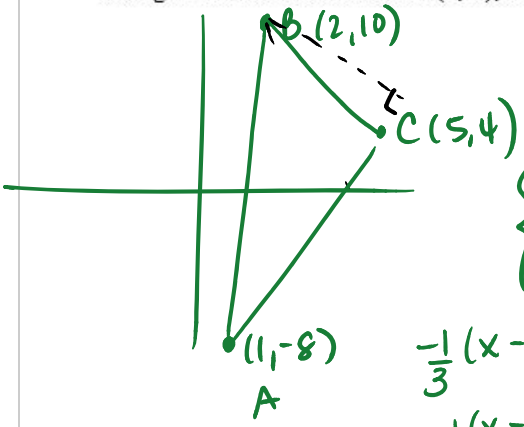


$\text{midpt}_{\overline{AB}} = \left(\frac{-1+2}{2}, \frac{-3+10}{2}\right) = \left(\frac{1}{2}, \frac{7}{2}\right)$

$m_{\text{median}} = \frac{\left(\frac{7}{2}-4\right)}{\left(\frac{1}{2}-5\right)} = \frac{1}{9}$

$y - \frac{7}{2} = \frac{1}{9}\left(x - \frac{1}{2}\right)$ OR $y - 4 = \frac{1}{9}(x-5)$

Objective 5: Find the length of an altitude of a triangle
Triangle ABC has coordinates A(1,-8), B(2,10), and C(5,4). Find the length of the altitude from B.



$m_{\overline{AC}} = \frac{4+8}{5-1} = \frac{12}{4} = 3$

$\begin{cases} y - 10 = -\frac{1}{3}(x-2) \\ y - 4 = 3(x-5) \end{cases}$

$-\frac{1}{3}(x-2)+10 = 3(x-5)+4$

$-1(x-2)+30 = 9(x-5)+12$

$-x+2+30 = 9x-45+12$

$65 = 10x$

$6.5 = x$

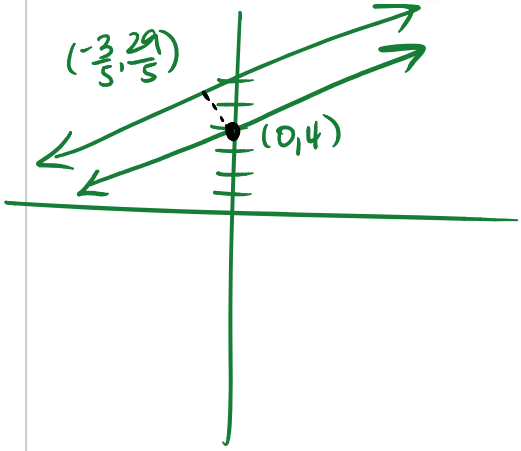
$8.5 = y$

$d = \sqrt{22.5}$

$= \frac{\sqrt{90}}{2} = \frac{3\sqrt{10}}{2}$

Objective 6: Compute the distance between two lines

Find the distance between $y = \frac{1}{3}x + 4$ and $y = \frac{1}{3}x + 6$.



$\begin{cases} y = \frac{1}{3}x + 6 \\ y = -3x + 4 \end{cases}$

$\frac{1}{3}x + 6 = -3x + 4$

$x + 18 = -9x + 12$

$10x = -6$

$x = -\frac{3}{5}, \quad y = \frac{29}{5}$

$d = \sqrt{\frac{18}{5}}$

$= \frac{3\sqrt{2}}{\sqrt{5}}$

$= \frac{3\sqrt{10}}{5}$

Objective 7: Complete the square to write the equation of a circle in standard form

Write the standard form equation of the circle $x^2 + y^2 - 16x - 6y = 62$ and identify the center and radius.

$x^2 - 16x + 64 + y^2 - 6y + 9 = 62 + 64 + 9$

$(x-8)^2 + (y-3)^2 = 135$

Center: $(8, 3)$

radius: $\sqrt{135} = 3\sqrt{15}$

Objective 8: Find the length of the common internal or external tangents

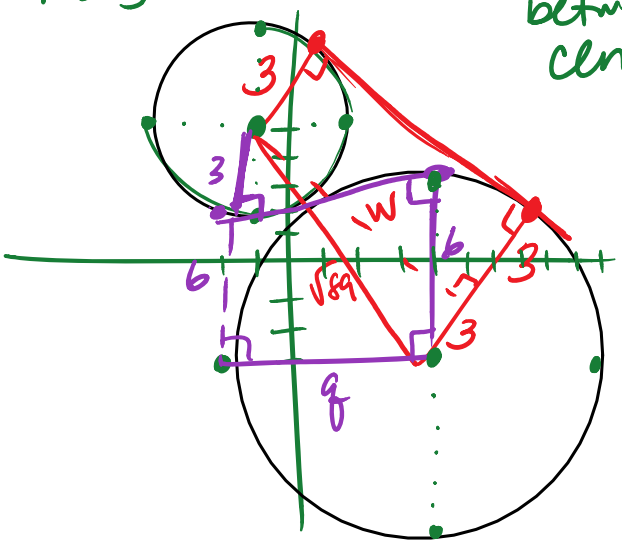
Find the length of the common external tangent between the two circles $(x-4)^2 + (y+3)^2 = 36$ and $(x+1)^2 + (y-5)^2 = 9$.

Center: $(-1, 5)$

$r = 3$

Center: $(4, -3)$ $r = 6$

distance between centers $= \sqrt{89}$



Common external:

$3^2 + w^2 = (\sqrt{89})^2$

$w^2 = 80$

$w = 4\sqrt{5}$

Common internal:

$q^2 + q^2 = (\sqrt{89})^2$

$q^2 = 8$

$q = 2\sqrt{2}$