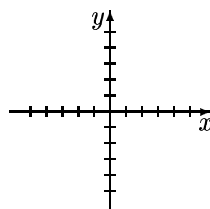


Linear Equation, Graphing, and Circle Problems

Math 130 *Kovitz*

1. Plot the point $(-3, 4)$.



2. Find the distance between the points $(13, -1)$ and $(17, 2)$, and find the coordinates of the midpoint of the line segment connecting them.
3. Find an equation of the straight line through $(3, 23)$ and $(10, -26)$. Then find the x - and y -intercepts and graph it, labeling the x and y -intercepts and the two given points.

Find and label the point on the graph where $y = x$.

Find and label the point on the graph where $x = -1.5$ and the point on the graph where $y = -1.5$.

4. Decide whether the set of points $A(2, 1)$, $B(5, 7)$, $C(8, 12)$ are collinear.
5. Determine for each of the six possible pairs of the following four lines whether the two lines are parallel, perpendicular, or neither.

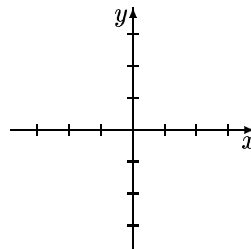
Give answers like this: (a) and (c) — neither.

- (a) $5x - 30y = 127$
- (b) $x = 22 + 6y$
- (c) $5x + 30y = -63$
- (d) $6x + y = 0$
6. Find an equation of the line perpendicular to the line $8x + 7y = -39$ and containing the point $(16, -3)$.
7. Determine whether the points $(213, 147)$, $(220, 208)$, and $(225, 207)$ are vertices of a right triangle. (Hint: find the slope of the line segment connecting each pair of points.)
8. Find an equation of the perpendicular bisector of the line segment with endpoints $(6, 7)$ and $(10, 5)$.

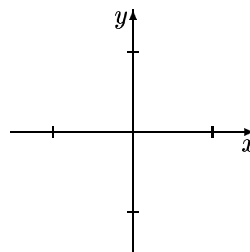
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9. Determine whether $(-2, -3)$ is a solution of $x^2 + xy + y^2 = 19$.

10. Graph $y = \frac{1}{|x|}$.



11. (a) Graph the equation $x^2 + y^2 = 1$.
 (b) At which points does it intersect the line $y = -x$?



12. (a) Find the center and radius of the circle

$$x^2 + y^2 - 2x + 8y - 8 = 0$$

- (b) Roughly graph it.
 (c) Find the points on it for which $x = 5$.
13. For the points $P(2, 4)$ and $Q(3, 2)$:
- (a) Compute the distance between the points.
 (b) Find the coordinates of the midpoint of the line segment connecting the two points.
 (c) Write an equation of the line through P and Q . Sketch the line.
 (d) Write an equation of the circle with center P and passing through Q . Sketch the circle on the same graph paper, and give the coordinates of four specific points on the circle.
 (e) Find the exact coordinates of the point(s) of intersection of the line and the circle.