1.1 Rectangular Coordinates

Vocab

rectangular coordinate system (a.k.a. Cartesian plane)

x-axis

y-axis

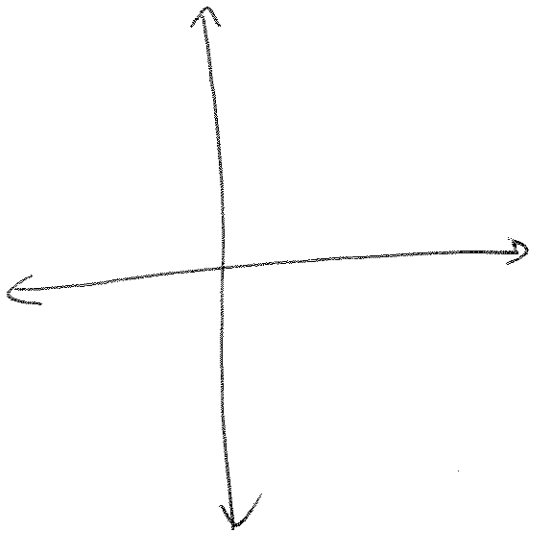
origin (a.k.a. (0,0))

quadrants

ordered pair (x,y)

x-coordinate

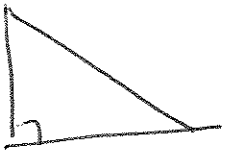
y-coordinate



Formulas

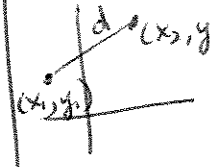
Pythagorean Theorem

Only true for right triangles!



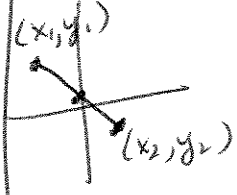
Distance Formula

between (x_1, y_1) and (x_2, y_2)



Midpoint Formula

between (x_1, y_1) and (x_2, y_2)



1.1 (cont)

Ex 1 Find coordinates of pt 10 units to left of y-axis and 3 units up.

Ex 2 If $-x > 0$ and $y < 0$, what quadrant is (x, y) in?

Ex 3 Find the distance between $(-3, -2)$ and $(4, 1)$.

1.1 (cont)

Ex 4 Find midpoint of line segment between $(5, 2)$ and $(-3, -1)$.

Ex 5 An airplane flies from Naples, Italy in a straight line to Rome, Italy, which is 120 km north and 150 km west of Naples. How far does the plane fly?

Ex 6 A room is $1\frac{1}{2}$ times as long as it is wide, and its perimeter is 25 meters. Find the dimensions of the room.

Ex 7 (Review) Solve these.

(a) $\frac{1}{3}x + 2 = 5 - \frac{1}{6}x$

(b) $3x - 8 \geq \frac{1}{2}(10x + 7)$

Optional Review assignment: A3 #1-191 e.o.o., A4 #1-71 odd, A5 #1-47 odd, 55-133 e.o.o., 135-183 odd, 189

1.2 Graphs of Equations

Vocab

(1) equation in two variables

(a) solution (of eqn in two variables) (a.k.a. ordered pair for that equation)

(b) graph

(c) x-intercept

(d) y-intercept

(2) Symmetry ⇒

	algebraic	geometric
(a) wrt x-axis	⇒ if (x,y) is on graph, then so is $(x,-y)$.	
(b) wrt y-axis		
(c) wrt origin		

Formula

Standard Eqn of a Circle

$(x-h)^2 + (y-k)^2 = r^2$ where (h,k) = center of circle
r = radius of circle

all (x,y) pts are on circle

1.2 (cont)

Ex 1 Does the pt $(1,5)$ lie on the graph of $y = 4 - |x-2|$?

Ex 2 Complete the table of points and sketch graph of

$$y = 5 - x^2$$

x	y
-2	
-1	
0	
1	
2	

Ex 3 Find x-intercept and y-intercept for these graphs.

(a) $y^2 = x + 1$

(b) $y = \sqrt{2x-1}$

Ex 4 Test for symmetry.

(a) $y = x^4 - x^2 + 3$

(b) $xy = 4$

Ex 5 Use symmetry to help graph the eqns:

(a) $y = 1 - |x|$

(c) $y = x^3 + x$

(b) $x = y^2 - 5$

1.2 (cont)

Ex 6 Write the standard form of the equation of the circle with the given characteristics.

(a) center: $(3, -2)$ radius: 5

(b) endpts of diameter: $(-4, -1)$, $(4, 1)$

Ex 7 (Review) Simplify the expressions.

(a) $\sqrt{18x} - \sqrt{2x}$

(b) $\dfrac{55}{\sqrt{20} - 3}$