$\boxed{P.1}$ Preparation for Calculus; Graphs & Models

#19.

Find any intercepts:

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

Find y-intercept:

$x = 0$

$y = (0)^2 + (0) - 2$

$y = 0 - 2$

$y = -2$

$(0, -2)$ is the y-intercept.

Find x-intercepts:

$y = 0$

$0 = x^2 + x - 2$

$0 = (x + 2)(x - 1)$

Either

$x + 2 = 0$, or $x - 1 = 0$

$x = -2$ $\qquad$ $x = 1$

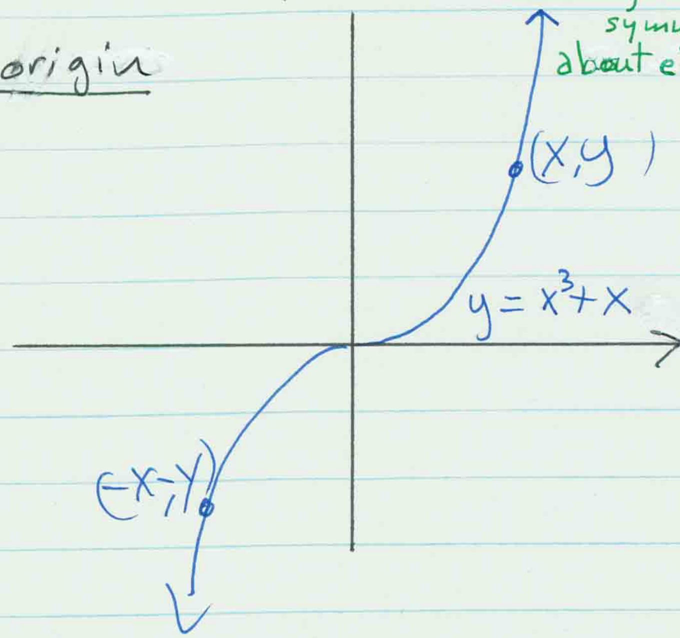
$(-2, 0)$ & $(1, 0)$ are x-intercepts.

#30

Test for symmetry:

$y = x^3 + x$

the graph tells us this function is clearly not symmetric about either axis.



Test for symmetry about <u>origin</u>

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

$-y = -x^3 - x$

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

$-y = -y$

#62

<u>Find points of intersection:</u>

$2x - 3y = 13$

$5x + 3y = 1$

$$
\begin{array}{rl}
+ & 2x - 3y = 13 \\
 & 5x + 3y = 1 \\
\hline
 & 7x \quad = 14
\end{array}
$$

$\frac{1}{7} \cdot 7x = \frac{1}{7} \cdot 14$

$x = 2$

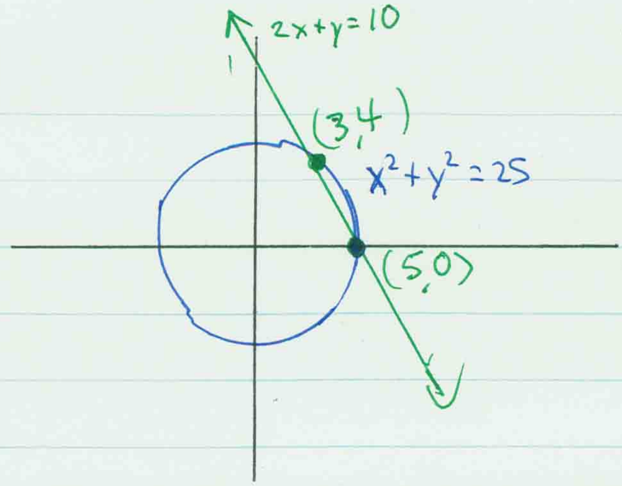
Find y: $5\cancel{x} + 3(2) = 1$

$-6 + 5x + 6 = 1 + (-6)$

$\frac{1}{5} \cdot 5x = -5 \cdot \frac{1}{5}$

$x = -1$

<u>The point of intersection is (-1, 2).</u>



Find the points of intersection!

#66 $x^2+y^2=25$

$2x+y=10$

$2x+y=10$

Use $y=-2x+10$ for substitution

$x^2+y^2=25$

$x^2+(-2x+10)^2=25$, solve for x

$x^2+(-2x+10)(-2x+10)=25$

$x^2+4x^2-20x-20x+100=25$

$-25+5x^2-40x+100=25+(-25)$

$5x^2-40x+75=0$

$\frac{1}{5}(5x^2-40x+75)=\frac{1}{5}\cdot 0$

$x^2-8x+15=0$

$(x-5)(x-3)=0$

Either

$x-5=0$, or $x-3=0$

$x=5$ $x=3$

Find y:

$2x+y=10$	
$x=5$, $2(5)+y=10$	$x=3$, $2(3)+y=10$
$-10+10+y=10+(-10)$	$-6+6+y=10+(-6)$
$y=0$	$y=4$

(5,0) & (3,4)

are the points of intersections.