PreCalculus: Ch. P Review 2 **Name:** Key

1. Using the points $A(-6,-7)$ and $B(-3,-1)$, for $\overline{AB}$ find the:

   a. slope of $\overline{AB}$ $\frac{-1+7}{-3+6} \to \frac{6}{3} \to$ **2**

   b. midpoint of $\overline{AB}$ $\left(\frac{-6-3}{2}, \frac{-7-1}{2}\right) \to$ **$\left(-\frac{9}{2}, -4\right)$**

   c. equation of the line containing $\overline{AB}$, in **General Form** $\left.\begin{matrix} m=2 \\ (-3,-1)\end{matrix}\right\}\begin{matrix} 2x-y=c \\ 2(-3)-(-1)\end{matrix}$ **$2x-y=-5$**

   d. equation of the circle with $\overline{AB}$ as its diameter $\left.\begin{matrix} M(-\frac{9}{2},-4) \\ pt(-3,-1)\end{matrix}\right\}\begin{matrix}(x+9/2)^2+(y+4)^2=r^2 \\ (-3+9/2)^2+(-1+4)^2\end{matrix}$ **$(x+\frac{9}{2})^2+(y+4)^2=\frac{45}{4}$**

2. ΔABC joins the points $A(-7,6)$, $B(-5,1)$, and $C(2,-1)$. Show whether ΔABC is or is not a right triangle.

   $mAB = \frac{1-6}{-5+7} \to \frac{-5}{2}$

   $mBC = \frac{-1-1}{2+5} \to \frac{-2}{7}$

   $mAC = \frac{-1-6}{2+7} \to \frac{-7}{9}$

   no $\perp$ slopes (opp. rec) $\to$ $\boxed{\text{no rt } \Delta}$

3. Determine the center and radius of the circle: $4x^2+4y^2+16x-4y+12=0$.

   $\xrightarrow{\div \text{ all by } 4}$ $x^2+y^2+4x-y+3=0$

   $(x^2+4x+\underline{4}) + (y^2-y+\underline{1/4}) = -3+\underline{4}+\underline{1/4}$

   $(x+2)^2+(y-1/2)^2 = 5/4$

   center: $(-2, 1/2)$

   radius: $\sqrt{5}/2$

4. Sketch the following graphs. Determine any x and/or y intercepts.

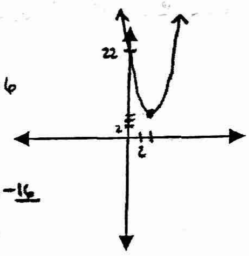
a] $y = x^2 - 8x + 22$

Finding Vertex (4, 6): $x = \frac{-(-8)}{2(1)} \to 4$; $y = 4^2 - 8(4) + 22 \to 6$

or

$y = (x^2 - 8x + 16) + 22 - 16$

$y = (x-4)^2 + 6$

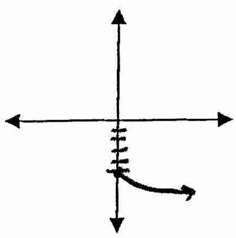


x int from graph: none (it does not cross x axis)

y int: $y = 0^2 - 8(0) + 22$, $y = 22$

XIs — YI 22

b] $y = -\sqrt{x} - 5$

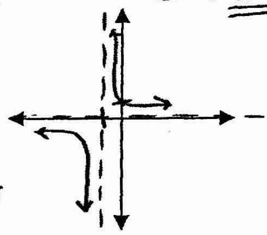


x int from graph: none (does not cross x axis)

y int from graph! $y = -\sqrt{0} - 5 = -5$

XIs — YI −5

c] $y = \frac{1}{(x+1)}$ $\leftarrow$ Left 1 ∘∘∘ $y = \frac{1}{x}$



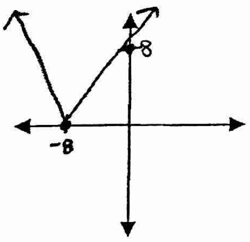
x int from graph: none (does not cross x axis)

y int: $y = \frac{1}{0+1} \to 1$

XIs — YI 1

d] $y = |x+8|$ (Left 8) ∘∘∘ $y = |x|$

y int: $y = |0+8|$ $= |8|$ $= 8$

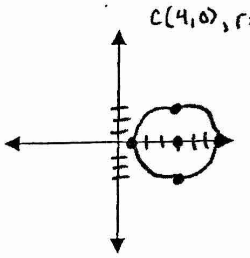


x int from graph -or- $0 = |x+8|$, $0 = x+8$, $x = -8$

XIs −8 YI 8

e] $(x-4)^2 + y^2 = 9$ ∘∘∘ $(x-h)^2+(y-k)^2=r^2$ center (h,k)

$C(4,0)$, $r=3$



x int from graph -or-

$(x-4)^2 + 0^2 = 9$

$(x-4)^2 = 9$

$x - 4 = \pm\sqrt{9}$

$x - 4 = \pm 3$

$x = 4 \pm 3 \to 1, 7$

y int from graph: none (does not cross y axis)

XIs 1, 7 YI —

5. Write the equation of each line in **General Form.**

a. slope of 4 and passes through $(-6,4)$ $2x+y=c$ $2(-6)+(4)$ $\underline{2x+y=-8}$

b. passes through $(-1,-2)$ and $(-8,4)$ $m=\frac{4+2}{-8+1}\to\frac{6}{-7}$ $6x+7y=c$ $6(-1)+7(-2)$ $\underline{6x+7y=-20}$

c. passes through $(-4,-2)$ and is parallel to $\boxed{5x+4y}=12$ $\parallel\to$ same $5x+4y=c$ $5(-4)+4(-2)$ $\underline{5x+4y=-28}$

d. the $\perp$ –bisector of the line segment that joins $(-5,8)$ and $(-4,5)$ $\underline{x-3y=-24}$

Find mdpt and $m=\frac{5-8}{-4+5}\to\frac{-3}{1}$ $m_{\perp}=\frac{1}{3}$ $M\left(\frac{-5-4}{2},\frac{8+5}{2}\right)$ $M\left(-\frac{9}{2},\frac{13}{2}\right)$ $1x-3y=c$ $\left(-\frac{9}{2}\right)-3\left(\frac{13}{2}\right)$

6. Solve for x.

a. $-8(x-2)+5x=-6(2-3x)$ $\underline{4/3}$

$-8x+16+5x=-12+18x\to-21x=-28\to x=\frac{28}{21}$ simplify!

b. $14-9x+x^2=0\to x^2-9x+14=0\to(x-7)(x-2)=0\to x=2,7$ $\underline{2,7}$

c. $\frac{1}{x+2}+\frac{4}{x-4}=\frac{4}{x^2-2x-8}\to(x-4)+4(x+2)=8\to x-4+4x+8=8\to5x=4\to$ $\underline{4/5}$

d. $8x^2-13x-15=0\to x=\frac{-(-13)\pm\sqrt{(-13)^2-4(8)(-15)}}{2(8)}\to x=\frac{13\pm\sqrt{649}}{16}$ $\underline{\frac{13\pm\sqrt{649}}{16}}$

** change this problem**

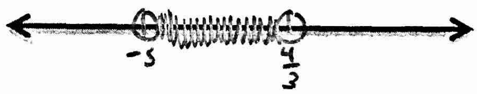
$\sqrt{5x-21}+3=\sqrt{5x}$ $(\sqrt{5x-21})^2=(\sqrt{5x}-3)^2$ $5x-21=5x-6\sqrt{5x}+9$ $30=6\sqrt{5x}$ $\to5=\sqrt{5x}$ $25=5x$ $x=5$ $\underline{5}$

f. $|12-3x|=2x+4$ $12-3x=2x+4$ $-5x=-8$ $x=8/5$, $12-3x=-(2x+4)$ $12-3x=-2x-4$ $-x=-16$ $x=16$ $\underline{8/5,16}$

7. Sketch the solution of each:

a. $3(12-x)>36+2x\to36-3x>36+2x$ $-x>0$ $x<0$

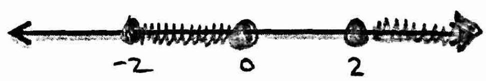
b. $3x^2+11x-12<8$ $3x^2+11x-20<0$ $(3x-4)(x+5)=0\to x=\frac{4}{3},-5$



c. $4|2x-5|\le16\to|2x-5|\le4\to$ $2x-5\le4$ AND $2x-5\geq-4$ $x\le9/2$ & $x\geq1/2$

ISOLATE bars!

d. $2x^3-8x\geq0\to2x(x^2-4)=0$ $x=0,\pm2$ $2x=0$ $x^2-4=0$



change this problem

$-\frac{4}{x+2}\le5$ $\frac{-4}{x+2}=\frac{5}{1}$ D.R. $x+2\neq0$ $x\neq-2$

$5(x+2)=-4$

$5x+10=-4$

$5x=-14$

$x=-\frac{14}{5}$