

PRECALCULUS

Test - Chapter P Review

Name Key

1) Using the points A(-6, -2) and B(3, 2), for segment AB find the:

a) slope of AB $\frac{-2-2}{-6-3} = \frac{-4}{-9} =$

b) midpoint of AB $(\frac{-6+3}{2}, \frac{-2+2}{2}) =$

c) equation of the line containing AB, in General Form $4x-9y=C$
 $12-18=C \quad C=-6$

d) equation of the circle with AB as its diameter
 $(x+\frac{3}{2})^2 + y^2 = r^2 \quad (3+\frac{3}{2})^2 + 2^2 = r^2 \quad r^2 = \frac{97}{4}$

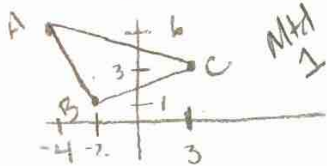
$$\frac{4}{9}$$

$$(-\frac{3}{2}, 0)$$

$$4x-9y = -6$$

$$(x+\frac{3}{2})^2 + y^2 = \frac{97}{4}$$

2) $\triangle ABC$ joins the points A(-4, 6), B(-2, 1), and C(3, 3). Show whether $\triangle ABC$ is or is not a right triangle.



$m_{AB} = \frac{5}{-2}$
 $m_{BC} = \frac{2}{5}$
 opp **OR** rec

$AB = \sqrt{4+25} = \sqrt{29}$
 $BC = \sqrt{25+4} = \sqrt{29}$
 $AC = \sqrt{49+9} = \sqrt{58}$
 $(\sqrt{29})^2 + (\sqrt{29})^2 = (\sqrt{58})^2$
 $29+29=58$
 $58=58 \checkmark$

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

$4x^2 + 16x + 4y^2 - 4y = -12$
 $x^2 + 4x + y^2 - y = -3$

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

$(x+2)^2 + (y-\frac{1}{2})^2 = \frac{5}{4}$

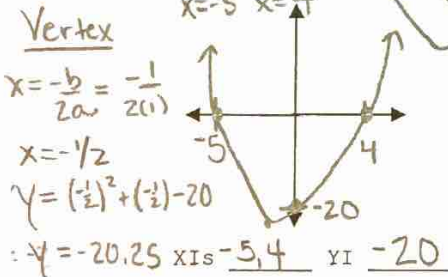
center $(-2, \frac{1}{2})$
 radius $\frac{\sqrt{5}}{2}$

4) Sketch the following graphs. Determine any x and/or y intercepts. Use the graphing calculator to aid in your sketch.

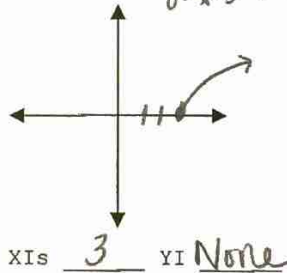
$y = 0^2 + 0 - 20 \quad y = -20$

a) $y = x^2 + x - 20$
 $(x+5)(x-4) = 0$
 $x = -5 \quad x = 4$

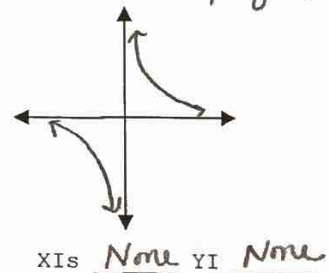
* must find VERTEX



$y = \sqrt{0-3} \quad y = \sqrt{-3}$
 Not RS
 $0 = \sqrt{x-3}$
 $0 = x-3 \quad x = 3$

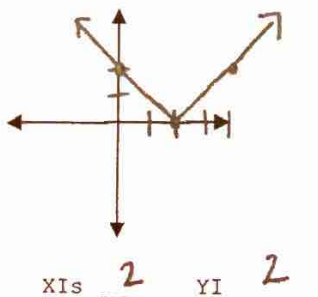


c) $y = \frac{2}{x}$
 $0 = \frac{2}{x}$ None
 $y = \frac{2}{0}$ undef

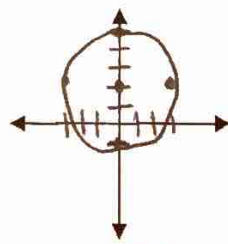


d) $y = |x-2|$

$y = |0-2|$
 $y = 2$
 $0 = |x-2|$
 $0 = x-2$
 $2 = x$



e) $(x)^2 + (y-2)^2 = 9$



C(0, 2)
 $0^2 + (y-2)^2 = 9$
 $y-2 = \pm 3$
 $y = 5, -1$

$x^2 + (0-2)^2 = 9$
 $x^2 = 9-4$
 $x^2 = 5$
 $x = \pm\sqrt{5}$

XIs $\pm\sqrt{5}$ YI 5, -1

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

a) slope of 4 and passes through (-1, 6) $4x - y = C$ $-4 - 6 = C$ $C = -10$

$4x - y = -10$

b) passes through (-3, 2) and (-4, 7) $m = \frac{5}{-1}$ $5x + y = C$ $-15 + 2 = C$ $C = -13$

$5x + y = -13$

c) passes through (4, -2) and is parallel to $3x - y = 9$
 $3x - y = C$ $12 + 2 = C$ $14 = C$

$3x - y = 14$

d) the \perp -bisector of the line segment that joins (5, -8) and (4, -5)

$x - 3y = 24$

$x - 3y = C$
 $\frac{5}{2} - 3(-\frac{13}{2}) = C$ $C = 24$
 midpt $(\frac{9}{2}, -\frac{13}{2})$ $m = -3/1$ $\perp m = 1/3$

6) Solve for x.

a) $-7(x - 3) + 6x = 3(8 - x)$ $-7x + 21 + 6x = 24 - 3x$ $2x = 3$

$x = 3/2$

b) $9 - 8x - x^2 = 0$ $x = \frac{8 \pm \sqrt{64 - 4(-1)(9)}}{2(-1)} = \frac{8 \pm \sqrt{100}}{-2} = \frac{8 \pm 10}{-2} = -2, -\frac{2}{-2}$

$x = -9, 1$

c) $(x+3)(x-2) (\frac{1}{x-2} + \frac{3}{x+3} = \frac{4}{x^2+x-6})$
 $(x+3) + 3(x-2) = 4$
 $x+3+3x-6=4$ $4x-3=4$ $4x=7$ $x=7/4$

$x = 7/4$

d) $9x^2 - 6x - 35 = 0$ $\frac{6 \pm \sqrt{36 - 4(9)(-35)}}{2(9)} = \frac{6 \pm 36}{18} = \frac{42}{18}, -\frac{30}{18}$

$x = \frac{7}{3}, -\frac{5}{3}$

e) $\sqrt{x} + \sqrt{x-20} = 10$ $\sqrt{x-20} = 10 - \sqrt{x}$ $(\sqrt{x-20})^2 = (10 - \sqrt{x})^2$
 $x - 20 = 100 - 20\sqrt{x} + x$ $-20 = 100 - 20\sqrt{x}$ $-120 = -20\sqrt{x}$ $\sqrt{x} = 6$ $x = 36$

$x = 36$

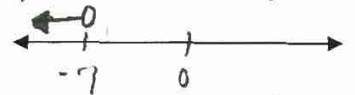
f) $|15 - 4x| = 5$ $15 - 4x = 5$ $x = 5/2$ $15 - 4x = -5$ $-4x = -20$ $x = 5$

$x = 5/2, 5$

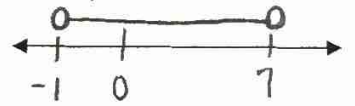
7) Sketch the solution of each: (Treat as equalities to solve for x \rightarrow then use test pts. to sketch)

a) $2(16 - x) > 81 + 5x$

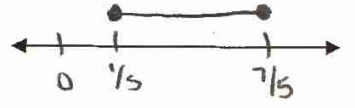
$32 - 2x > 81 + 5x$ $-49 > 7x$ $-7 > x$



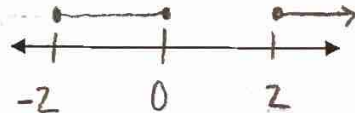
b) $x^2 - 6x + 9 < 16$ $x^2 - 6x - 7 < 0$ $x = \frac{6 \pm \sqrt{36 - 4(1)(-7)}}{2(1)} = \frac{6 \pm 8}{2} = 7, -1$



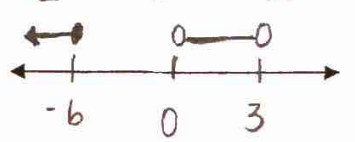
c) $3|4 - 5x| \leq 9$ $|4 - 5x| \leq 3$ $4 - 5x = 3$ $4 - 5x = -3$
 $-5x = -1$ $-5x = -7$
 $x = 1/5$ $x = 7/5$



d) $x^3 - 4x \geq 0$ $x(x^2 - 4) \geq 0$ $x(x-2)(x+2) = 0$ $x = 0, 2, -2$



e) $\left(\frac{2}{x} - \frac{3}{x-3} \geq 0\right)$ $\frac{2(x-3) - 3x \geq 0}{2x - 6 - 3x \geq 0}$ $-x \geq 6$ $x \leq -6$ $\frac{DR}{x=0, x=3}$



Test Pts

b) $0^2 - 6(0) + 9 < 16$ $9 < 16$ True

$(-2)^2 - 6(-2) + 9 < 16$ $25 < 16$ False

c) $3|4 - 5(0)| \leq 9$ $12 \leq 9$ False

$3|4 - 5(1/5)| \leq 9$ $6 \leq 9$ True

d) $(-1)^3 - 4(-1) \geq 0$ $-1 + 4 \geq 0$ $3 \geq 0$ T

$(-3)^3 - 4(-3) \geq 0$ $-27 + 12 \geq 0$

$(1)^3 - 4(1) \geq 0$ $1 - 4 \geq 0$ $-3 \geq 0$ F

$(3)^3 - 4(3) \geq 0$ $15 \geq 0$ T

$8^2 - 6(8) + 9 < 16$ $25 < 16$ False