COLLEGE REVIEW MATH NAME KEY

Review SECTION 6A (Circles)

Determine the center and radius for each equation of a circle given. (all square roots must be in simplest form)

1) $(x + 12)^2 + (y - 5)^2 = 400$

Center: (-12, 5)

radius = 20

$r^2 = 400$

$r = \sqrt{400}$

$r = 20$

2) $(x - \frac{1}{3})^2 + (y + \frac{2}{5})^2 = 24$

Center: (1/3, -2/5)

radius = $2\sqrt{6}$

$r^2 = 24$

$r = \sqrt{24}$

$r = \sqrt{4}\sqrt{6}$

$r = 2\sqrt{6}$

3) $x^2 + y^2 - 4y - 10x = 7$

$x^2 - 10x + \_\_\_\_ + y^2 - 4y + \_\_\_\_ = 7 + \_\_\_\_$

$x^2 - 10x + \underline{25} + y^2 - 4y + \underline{4} = 7 + \underline{29}$

$(x - 5)^2 + (y - 2)^2 = 36$

$r^2 = 36$

$r = \sqrt{36}$

$r = 6$

Center: (5, 2)

radius = 6

4) $x^2 + y^2 + 12y + 16 = 0$

$(x + 0)^2 + y^2 + 12y + \_\_\_\_ = -16 + \_\_\_\_$

$(x + 0)^2 + y^2 + 12y + \underline{36} = -16 + \underline{36}$

$(x + 0)^2 + (y + 6)^2 = 20$

$r^2 = 20$

$r = \sqrt{20}$

$r = \sqrt{4}\,\sqrt{5} = 2\sqrt{5}$

Center: (0, -6)

radius = $2\sqrt{5}$

Change each equation into center-radius form.

5) $2x^2 + 2y^2 + 8x - 12y = 24$

divide by 2

$x^2 + y^2 + 4x - 6y = 12$

$x^2 + 4x + \_\_\_\_ + y^2 - 6y + \_\_\_\_ = 24 + \_\_\_\_$

$x^2 + 4x + \underline{4} + y^2 - 6y + \underline{9} = 24 + \underline{13}$

$(x + 2)^2 + (y - 3)^2 = 25$

6) $-3x^2 - 3y^2 - 24x - 9y - 8 = 0$

divide by -3

$x^2 + y^2 + 8x + 3y = -8/3$

$x^2 + 8x + \_\_\_\_ + y^2 + 3y + \_\_\_\_ = -8/3 + \_\_\_\_$

$x^2 + 8x + \underline{16} + y^2 + 3y + \underline{9/4} = -8/3 + \underline{16 + 9/4}$

$(x + 4)^2 + (y + 3/2)^2 = 187/12$

Write an equation in circle-radius form for each circle using the information given.

7) C(1, -8) and r = 2.5 — Equation: $(x-1)^2+(y+8)^2=6.25$

8) C(-18, 0) and r = $\dfrac{2}{7}$ — Equation: $(x+18)^2+y^2=\dfrac{4}{49}$

9) C(0, 7) and r = $\sqrt{11}$ — Equation: $x^2+(y-7)^2=11$

10) C(-1, -4) and passes thru (2, -8) — Equation: $(x+1)^2+(y+4)^2=25$

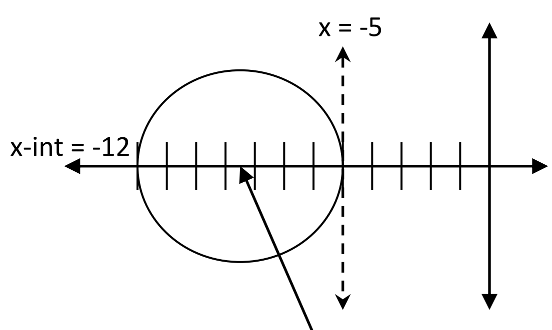
$(x + 1)^2 + (y + 4)^2 = r^2$
$(2 + 1)^2 + (-8 + 4)^2 = r^2$
$9 + 16 = r^2$ $\qquad r^2 = 25$

11) (4, 0) and (8, - 6) are the endpoints of the circle's diameter — Equation: $(x-6)^2+(y+3)^2=13$

midpoint = $\left(\dfrac{4+8}{2},\dfrac{0-6}{2}\right)=(6,-3)$

$$(x-6)^2+(y+3)^2=r^2$$
$$(8-6)^2+(-6+3)^2=r^2$$
$$4+9=r^2$$
$$r^2=13$$

12) Tangent to the line x = -5 and has an x-intercept of -12 — Equation: $(x+8.5)^2+y^2=12.25$



center is half way between (-8.5, 0)

plug in to find r^2

$$(x+8.5)^2+(y-0)^2=r^2$$
$$(-5+8.5)^2+(0-0)^2=r^2$$
$$3.5^2+0=r^2$$
$$12.25=r^2$$

or just count 3.5 units in drawing

13) Find the intersection point or points to the following system. If they do not intersect state so.

$x - y = 5$
$x^2 + y^2 = 53$

$x = y + 5$
plug in: $(y + 5)^2 + y^2 = 53$
$y^2 + 5y + 5y + 25 + y^2 = 53$
$2y^2 + 10y - 28 = 0$
$y^2 + 5y - 14 = 0$
$(y + 7)(y - 2) = 0$
$y = -7$ and $y = 2$

plug in to find x:
$x = -7 + 5$ and $x = 2 + 5$
$x = -2$ $\qquad$ $x = 7$

points of intersection are:
(-2, -7) and (7, 2)