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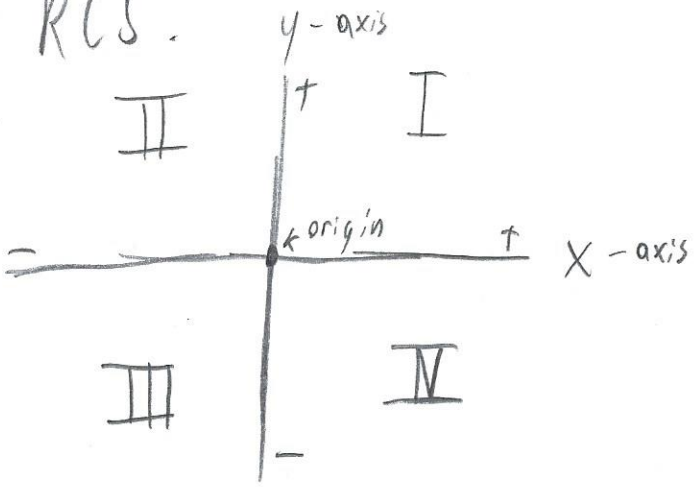
Test Review

P6

Details of the RCS:



Distance formula: $(2, 5), (5, 1)$ — $x_1\ y_1$, $x_2\ y_2$

plug in the example

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} = \sqrt{(5-2)^2 + (1-5)^2}$$

$$= \sqrt{(3)^2 + (-4)^2}$$

$$= \sqrt{9+16}$$

$$= \sqrt{25} = 5$$

Midpoint Formula: used for midpoint of line segments.

plug in example

$$\text{Midpoint} = \left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right) = \left(\frac{2+5}{2}, \frac{5+1}{2}\right) = \left(\frac{7}{2}, 3\right)$$

or

$$= (3.5, 3)$$

Concepts You Will See on the Third Test

P.6 Rectangular Coordinate System

Details of the RCS

Distance Formula $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

Midpoint Formula Midpoint = $(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2})$

Pythagorean Theorem ($a^2 + b^2 = c^2$) and its applications

1.1 Graphs of Equations

Finding the x- and y-intercept

Determining if a point is on a line

Using the Standard Form of a Circle $(x - h)^2 + (y - k)^2 = r^2$ to find center and radius and vice versa

Finding the equation of a circle when given the endpoints of a diameter

1.2 Solving Linear Equations

Examples of equations with one, no or all solutions

Equations involving Fractions

Fraction = Fraction; Cross Multiply

Multiple Fractions; 1) Find LCM of denominators; 2) Multiply all terms by that LCM

1.3 Word Problems

Percentages ($\frac{is}{of} = \frac{\%}{100}$); Finances; Averaging Grades; Measuring ($\frac{object_1}{shadow_1} = \frac{object_2}{shadow_2}$)

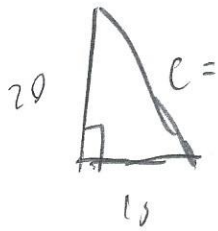
Remember to use the same units in each fraction!

1.4 Solving Quadratic Equations

Solving by: 1) Factoring Method; 2) The Square Root Method; 3) The Quadratic Formula

The Discriminant: 1) Finding the Discriminant ($b^2 - 4ac$); 2) Determining its implications (is it positive, negative or zero?)

Pythagorean Theorem: $a^2 + b^2 = c^2$



$(20)^2 + (15)^2 = c^2$

$400 + 225 = c^2$

$c^2 = 625$

$\sqrt{c^2} = \sqrt{625}$

$c = 25$

1.1:

$$2x + 3y = 12$$

Intercepts:

x-intercept: (Let $y = 0$ and solve for x)

$2x + 3(0) = 12$

$2x = 12$

$x = 6$ $\quad (6, 0)$

y-intercept: (Let $x = 0$ and solve for y)

$2(0) + 3y = 12$

$3y = 12$

$y = 4$ $\quad (0, 4)$

Is a pt on a line: Ex: Is $(1,5)$ on $2x+3y=12$

$2(1)+3(5)=12$

$2+15=12$

$17 \neq 12$ So $(1,5)$ is not on the line.

Circles:

Ex: Center: $(5,2)$

radius: 7

So, the standard form of the circle is $(x-5)^2+(y-2)^2=7^2$

Ex: If $(x+2)^2+y^2=64$

center: $(-2,0)$

radius: $\sqrt{64}=8$

Ex: $(2,1), (6,3)$ are the endpoints of a diameter of the circle

1) midpoint → center
2) Distance → radius

1) $\left(\frac{2+6}{2}, \frac{1+3}{2}\right) = \left(\frac{8}{2}, \frac{4}{2}\right) = (4,2)$

2) $d=\sqrt{(6-4)^2+(3-2)^2} = \sqrt{(2)^2+(1)^2}$

$= \sqrt{5}$

center: $(4,2)$

radius: $\sqrt{5}$

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

1.2:

Ex: $\frac{3x-5}{2x-1} = \frac{4}{5} \rightarrow (3x-5)(5) = (2x-1)(4)$

$15x - 25 = 8x - 4$

$-8x \quad +25 \qquad -8x \quad +25$

$\frac{7x}{7} = \frac{21}{7}$

$x = 3$

Ex: $7 + \frac{x}{4} = 9 + \frac{x}{8}$

1) LCM is 8

2) Multiply all terms by LCM

$7 \cdot 8 + 8 \cdot \frac{x}{4} = 9 \cdot 8 + 8 \cdot \frac{x}{8}$

$56 + 2x = 72 + x$

$-56 \quad -x \qquad -56 \quad -x$

$x = 16$

1.3 Ex: 78 is what % of 200?

$\left(\frac{\text{is}}{\text{of}} = \frac{\%}{100}\right)$

$\frac{78}{200} = \frac{x}{100}$

$78 \cdot 100 = 200x$

$\frac{7800}{200} = \frac{200x}{200}$

$x = 39$

Ex: Thing 1 is x ft tall and casts a 5 ft shadow.
Thing 2 is 5 yards tall and costs a 2 ft shadow.

$\frac{x\text{ ft}}{5\text{ ft}} = \frac{5\text{ yards}}{2\text{ ft}}$

1 yard = 3 ft

5 yards = 15 ft

$\frac{x\text{ ft}}{5\text{ ft}} = \frac{15\text{ ft}}{2\text{ ft}}$

$\frac{x}{5} = \frac{15}{2}$

$2x = 5 \cdot 15$

$\frac{2x}{2} = \frac{75}{2}$

$x = 37.5$

1.4:

Ex: $x^2 + 13x + 42 = 0$

$(x+6)(x+7) = 0$

$x+6=0$ $\quad$ $x+7=0$

$x=-6$ $\quad$ $x=-7$

Ex: $4x^2 - 25 = 0$

$4x^2 = 25$

$2x = \pm 5$

$x = \pm \frac{5}{2}$

Ex: $x^2 + 5x + 2 = 0$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-5 \pm \sqrt{(5)^2 - 4(1)(2)}}{2(1)}$$

$$= \frac{-5 \pm \sqrt{25 - 8}}{2}$$

$$= \frac{-5 \pm \sqrt{17}}{2}$$

Discriminant: $(b^2 - 4ac)$