

Test Review

I. Write the equation of the circle in standard form, Identify the center and radius

① $x^2 + y^2 + 6x - 4y - 3 = 0$

$$(x+3)^2 + (y-2)^2 = 16 \quad (-3, 2)$$

$$r = 4$$

② $x^2 + y^2 - 8x - 6y - 39 = 0$

$$(x-4)^2 + (y-3)^2 = 64 \quad (4, 3)$$

$$r = 8$$

③ Circle with endpoints of diameter $(-6, 0)$ and $(4, -2)$

$$(x+1)^2 + (y+1)^2 = 26 \quad (-1, -1)$$

$$r = \sqrt{26}$$

④ $x^2 + y^2 - 12x + 10y + 12 = 0$

$$(x-6)^2 + (y+5)^2 = 49 \quad (6, -5)$$

$$r = 7$$

II. Write the equation of the ellipse in standard form. Identify the center, a value and b value

⑤ $3x^2 + y^2 - 42x + 4y + 142 = 0$

$$\frac{(x-7)^2}{3} + \frac{(y+2)^2}{9} = 1$$

$$a = \sqrt{3}$$

$$b = 3$$

⑥ $x^2 + 4y^2 - 6x - 7 = 0$

$$\frac{(x-3)^2}{16} + \frac{y^2}{4} = 1$$

$$a = 4$$

$$b = 2$$

⑦ $4x^2 + y^2 - 24x + 4y + 24 = 0$

$$\frac{(x-3)^2}{4} + \frac{(y+2)^2}{16} = 1$$

$$a = 2$$

$$b = 4$$

⑧ $\frac{4}{9}(x-3)^2 + \frac{25}{16}(y+2)^2 = 1$

$$\frac{(x-3)^2}{9/4} + \frac{(y+2)^2}{16/25} = 1$$

$$a = 3/2$$

$$b = 4/5$$

II. Write the equation of the parabola in vertex form. Identify the a) vertex b) Equation of axis of symmetry c) Focus point d) Equation of directrix line

⑨ $-12y + 10 = x^2 - 4x + 14$
 $y = -\frac{1}{12}(x-2)^2 - 1$
 center $(2, 0) = V$
 vertex $(2, -3) = F$
 AOS $y = 3$
 Dir $x = 2$

⑩ $y^2 + 33 = -8x - 23$
 $x = -\frac{1}{8}y^2 - 7$
 vertex $(-7, 0)$
 AOS $y = 0$
 Dir $x = -5$
 F $(-9, 0)$

⑪ $y^2 + 21 = -20x - 6y - 68$
 $x = -\frac{1}{20}(y+3)^2 - 4$
 V $(-4, -3)$
 AOS $(-9, -3) = F$
 AOS $y = -3$
 Dir $x = 1$

III. Write the hyperbola in standard form. Identify the a) center b) Foci c) Vertices d) ~~equation of asymptotes~~ d) a and b

⑫ $25x^2 - 16y^2 + 100x + 96y = 444$

$\frac{(x+2)^2}{16} - \frac{(y+3)^2}{25} = 1$
 center $(-2, -3)$

$a = 4$ $c = \sqrt{41}$ $b = 5$
 vertex $(-2 \pm 4, -3)$
 Foci $(-2 \pm \sqrt{41}, -3)$

⑬ $\frac{(x-5)^2}{49} - \frac{(y-1)^2}{17} = 1$

center $(5, 1)$ $a = 7$
 vertex $(-2, 1)$ $(12, 1)$ $b = \sqrt{17}$
 Foci $(5 - \sqrt{66}, 1)$ $c = \sqrt{66}$
 $(5 + \sqrt{66}, 1)$

Find the derivative

(14) $y = 3x^3 - 5x^2 + 2x + 1$

$$y' = 9x^2 - 10x + 2$$

(15) $y = \frac{5x^5 - 3x^4 + 6x^2 + x}{x}$

$$y' = 20x^3 - 9x^2 + 6$$

(6) $y = 3\sqrt{x}$

$$y' = \frac{3}{2}x^{-1/2}$$

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

$$y' = -\frac{4}{3}x + 5$$

(8) $y = \frac{8x^4 - 6x^3 + 4x^2 + 2x}{2x}$

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

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

$$y' = 2x^4 - 3x + 2$$

(20) $y = \sqrt{x}(x-3)$

$$y' = \frac{3}{2}x^{1/2} - \frac{3}{2}x^{-1/2}$$

(21) $y = 2(x-3)^2$

$$y' = 4x - 12$$

(22) $y = \sqrt[3]{x}$

$$y' = \frac{1}{3}x^{-2/3}$$

(23) $y = -12$

$$y' = 0$$

(24) $y = -4x - 3$

$$y' = -4$$

(25) $\lim_{h \rightarrow 0} \frac{-4(x+h) - 3 - [-4x - 3]}{h}$

$$-4$$