Write the equation for each.

1. parabola $y=a(x-h)^2+k$

2. ellipse $\frac{(x-h)^2}{a^2}+\frac{(y-k)^2}{b^2}=1$

Nov 19-10:08 AM

Inverse 3x3

① Find the Determinant
If det = 0 no Inverse

② $\begin{bmatrix} & & \\ & & \\ & & \end{bmatrix}$ ⑤ $\frac{1}{det}\begin{bmatrix} & & \\ & & \\ & & \end{bmatrix}=A^{-1}$

③ $\begin{bmatrix} + & - & + \\ - & + & - \\ + & - & + \end{bmatrix}$

④ $\begin{bmatrix} & \\ & \end{bmatrix}$

Nov 19-10:14 AM

Finding the center, vertices, & foci ellipse

$\frac{(x-4)^2}{36}+\frac{(y+2)^2}{100}=1$

b^2 a^2

center $(4,-2)$

Vertices $(4,8)$ $(4,-12)$

foci $(4,6)$ $(4,-10)$

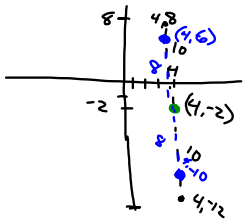
$a^2=100$

$a=10$

$c=8$

$a^2-b^2=c^2$

$100-36=64$



Nov 19-10:19 AM

Finding the first terms

$a_n=\frac{-5n^2}{2^n}$ Find the first 4 terms

$a_1=\frac{-5(1)^2}{2^1}=\frac{-5}{2}$

$a_2=\frac{-5(2)^2}{2^2}=\frac{-20}{4}=-5$

$a_3=\frac{-5(3)^2}{2^3}=\frac{-45}{8}$

$a_4=\frac{-5(4)^2}{2^4}=\frac{-80}{16}=-5$

$-\frac{5}{2}, -5, -\frac{45}{8}, -5$

Nov 19-10:25 AM

$-2, -9, -16, -23, \ldots$

Find the explicit formula

$a_n=a_1+(n-1)d$

$a_n=-2+(n-1)(-7)$

$a_n=-2+-7n+7$

$a_n=-7n+5$

a_1 - first term

d - difference

Nov 19-10:29 AM

Sum of sequences

① $7+12+17+\ldots+652=$
a_1 a_n

$S_n=\frac{n(a_1+a_n)}{2}$

① $a_n=a_1+(n-1)d$

$652=7+(n-1)5$

$652=7+5n-5$

$\frac{652}{2}=\frac{5n+2}{2}$

$650=5n$

$n=130$

② $S_n=\frac{130(7+652)}{2}$

$S_n=\frac{130(659)}{2}$

$S_n=42,835$

Nov 19-10:32 AM

Sum of sequence

$S_n = \frac{n(a_1+a_n)}{2}$

$a_n = a_1 + (n-1)d$

(b) $\sum_{j=1}^{137}(-3j+11) =$

$S_n = \frac{n(a_1+a_n)}{2}$

$-3(1)+11 = 8$

$-3(137)+11 = -400$

$S_n = \frac{137(8-400)}{2}$

$S_n = -26{,}852$

Nov 19-10:32 AM

Factorial

$5! = 5\cdot4\cdot3\cdot2\cdot1$

$\frac{7!\,5!}{6!\,8!}$

$\frac{7!\,5!}{6\cdot5!\,8\cdot7!} = \frac{1}{48}$

$\frac{(7!\,5!)}{(6!\,8!)} = \frac{1}{48}$

Nov 19-10:42 AM

Finding Inverse 3x3

$A = \begin{bmatrix} -5 & 5 & 0 \\ 2 & 0 & -2 \\ -1 & 3 & -5 \end{bmatrix}$

$\det: -5\begin{vmatrix} 0 & -2 \\ 3 & -5 \end{vmatrix} - 5\begin{vmatrix} 2 & -2 \\ -1 & -5 \end{vmatrix} + 0\begin{vmatrix} 2 & 0 \\ -1 & 3 \end{vmatrix}$

$= -5(0+6) - 5(-10-2)$

$= -30+60$

$= 30$

Nov 19-10:45 AM

Finding Inverse 3x3

$\det = 30$

$A = \begin{bmatrix} -5 & 5 & 0 \\ 2 & 0 & -2 \\ -1 & 3 & -5 \end{bmatrix}$

$A = \begin{bmatrix} \begin{vmatrix} 0 & -2 \\ 3 & -5 \end{vmatrix} & \begin{vmatrix} 2 & -2 \\ -1 & -5 \end{vmatrix} & \begin{vmatrix} 2 & 0 \\ -1 & 3 \end{vmatrix} \\ \begin{vmatrix} 5 & 0 \\ 3 & -5 \end{vmatrix} & \begin{vmatrix} -5 & 0 \\ -1 & -5 \end{vmatrix} & \begin{vmatrix} -5 & 5 \\ -1 & 3 \end{vmatrix} \\ \begin{vmatrix} 5 & 0 \\ 0 & -2 \end{vmatrix} & \begin{vmatrix} -5 & 0 \\ 2 & -2 \end{vmatrix} & \begin{vmatrix} -5 & 5 \\ 2 & 0 \end{vmatrix} \end{bmatrix} = \begin{bmatrix} 6 & -12 & 6 \\ -25 & 25 & -10 \\ -10 & 10 & -10 \end{bmatrix} \cdot \begin{matrix} + & - & + \\ - & + & - \\ + & - & + \end{matrix}$

$\begin{bmatrix} 6 & 12 & 6 \\ 25 & 25 & 10 \\ -10 & -10 & -10 \end{bmatrix}$

Nov 19-10:45 AM

Finding Inverse 3x3

$\det = 30$

$A = \begin{bmatrix} -5 & 5 & 0 \\ 2 & 0 & -2 \\ -1 & 3 & -5 \end{bmatrix}$

$\begin{bmatrix} 6 & 12 & 6 \\ 25 & 25 & 10 \\ -10 & -10 & -10 \end{bmatrix} \rightarrow \begin{bmatrix} 6 & 25 & -10 \\ 12 & 25 & -10 \\ 6 & 10 & -10 \end{bmatrix}$

$A^{-1} = \frac{1}{30}\begin{bmatrix} 6 & 25 & -10 \\ 12 & 25 & -10 \\ 6 & 10 & -10 \end{bmatrix} = \begin{bmatrix} \frac{6}{30} & \frac{25}{30} & \frac{-10}{30} \\ \frac{12}{30} & \frac{25}{30} & \frac{-10}{30} \\ \frac{6}{30} & \frac{10}{30} & \frac{-10}{30} \end{bmatrix} = \begin{bmatrix} \frac{1}{5} & \frac{5}{6} & -\frac{1}{3} \\ \frac{2}{5} & \frac{5}{6} & -\frac{1}{3} \\ \frac{1}{5} & \frac{1}{3} & -\frac{1}{3} \end{bmatrix}$

Nov 19-10:45 AM

$\begin{bmatrix} 1 & 4 & -6 \\ 2 & 5 & -7 \\ -3 & 0 & -2 \end{bmatrix}$

$1\begin{vmatrix} 5 & -7 \\ 0 & -2 \end{vmatrix} - 4\begin{vmatrix} 2 & -7 \\ -3 & -2 \end{vmatrix} + -6\begin{vmatrix} 2 & 5 \\ -3 & 0 \end{vmatrix}$

$-10 - 4(-4-21) - 6(+15)$

$-10 + 100 - 90$

0

Nov 19-11:08 AM

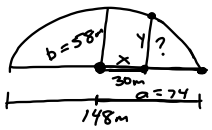
$\begin{bmatrix} -5 & 0 & 5 \\ 2 & -2 & 0 \\ -1 & -5 & 3 \end{bmatrix}$ det = -30

$\begin{bmatrix} \begin{vmatrix} -2 & 0 \\ -5 & 3 \end{vmatrix} & \begin{vmatrix} 2 & 0 \\ -1 & 3 \end{vmatrix} & \begin{vmatrix} 2 & -2 \\ -1 & -5 \end{vmatrix} \\ \begin{vmatrix} 0 & 5 \\ -5 & 3 \end{vmatrix} & \begin{vmatrix} -5 & 5 \\ -1 & 3 \end{vmatrix} & \begin{vmatrix} -5 & 0 \\ -1 & -5 \end{vmatrix} \\ \begin{vmatrix} 0 & 5 \\ -2 & 0 \end{vmatrix} & \begin{vmatrix} -5 & 5 \\ 2 & 0 \end{vmatrix} & \begin{vmatrix} -5 & 0 \\ 2 & -2 \end{vmatrix} \end{bmatrix} = \begin{bmatrix} -6 & 6 & -12 \\ 25 & -10 & 25 \\ 10 & -10 & 10 \end{bmatrix}$ + − + / − + − / + − +

$\begin{bmatrix} -6 & -6 & -12 \\ -25 & -10 & -25 \\ 10 & 10 & 10 \end{bmatrix}$

$-\frac{1}{30}\begin{bmatrix} -6 & -25 & 10 \\ -6 & -10 & 10 \\ -12 & -25 & 10 \end{bmatrix} = \begin{bmatrix} \frac{1}{5} & \frac{5}{6} & -\frac{1}{3} \\ \frac{1}{5} & \frac{1}{3} & -\frac{1}{3} \\ \frac{2}{5} & \frac{5}{6} & -\frac{1}{3} \end{bmatrix}$

Nov 19-11:11 AM



$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$

$\frac{30^2}{74^2} + \frac{y^2}{58^2} = 1$

$y^2 =$

$y = 53.02$

$\frac{y^2}{58^2} =$

Nov 19-11:19 AM

Parabola

$y = x^2$ p = focus = 2

$x^2 = 4py$

$x^2 = 4(2)y$

$x^2 = 8y$

$x^2 = 8(50)$

$x^2 = 400$

$x = 20$

$x = -20$

Dish = 40m

Nov 19-3:02 PM

$(x-3)^2 = -2(y-2)$ $(x-h)^2 = 4p(y-k)$

$y = x^2$

1 x (3, 2)

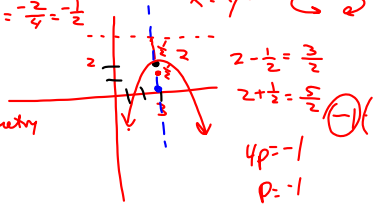
Inside Focus (3, 3/2) $4p = -2$, $p = -\frac{2}{4} = -\frac{1}{2}$

Directrix $y = \frac{5}{2}$

Axis of symmetry $x = 3$

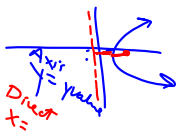
$(y-k)^2 = 4p(x-h)$

$x = y^2$



$4p = -1$

$p = -1$



Nov 19-3:08 PM