1. $4x^2 = 15x + 25$
2. $x^2 - 10x + 61 = 0$
3. $3x^2 - 42x + 147 = 0$
4. $\sqrt{5x+46} = x+8$
5. $f(x) = \begin{cases} x+2 & \text{if } x < 4 \\ x-2 & \text{if } x \geq 4 \end{cases}$ graph
6. $f(x) = x^2 - 2x + 2$ find $\frac{f(x+4) - f(x)}{4}$
7. $f(x) = \sqrt{20 - 4x}$ find domain
8. $f(x) = 2x^2 + 24x + 64$, $g(x) = x + 8$, find $(f \circ g)(x)$
9. $f(x) = 1 - x$, $g(x) = 2x^2 + x + 2$, find $(f \circ g)(x)$
10. $f(x) = 1 - x$, $g(x) = 2x^2 + x + 2$, find $(g \circ f)(x)$
11. (4, 5) (16, 14) find distance
12. (4, 10) (2, 8) find midpoint
13. $x^2 + y^2 + 4x + 6y + 9 = 0$ graph
14. $f(x) = (x-2)^2 + 3$ graph
15. $f(x) = x^2 - 4x - 5$ graph
16. $f(x) = 4x - x^2 + 5$ graph
17. $f(x) = 3x^3 - 7x^2 - 75x + 175 = 0$ Solve if $x = -5$ is a sol
18. $8x^3 - 46x^2 + 31x - 5 = 0$ Solve if $x = 5$ is a solution
19. $y = \frac{x - 10}{3x^2 + x + 1}$ find horizontal Asymptote
20. $f(x) = \frac{2x^2 - 6x + 4}{x - 2}$ find Slant asymptote
21. $f(x) = \frac{18x}{3x^2 + 4}$ find horizontal asymptote
22. $g(x) = \frac{10x^2}{5x^2 + 3}$ find horizontal asymptote
23. $f(x) = \log(9 - x)$ find domain
24. $\log_6\left(\frac{x^3 y}{27}\right)$ expand
25. $9^{x+9} = 243^{x-3}$ solve
26. $2^{x+3} = 283$ Solve
27. $\log_7(x) + \log_7(6x - 1) = 1$ Solve
28. $\log_6(x + 26) - \log_6(x - 9) = 2$ solve
29. $\log(x) + \log(x + 6) = \log(7)$ solve
30. $22000 = 12500\left(1 + \frac{.0675}{2}\right)^{2t}$
31. $10 = 5e^{0.009x}$
32. $x + y + 9z = 22$
$x + y + 3z = 10$
$x + 6y - 6z = -3$
33. $\sum_{x=1}^{4} x(x+1)$
34. $(2x + 4)^3$ Expand
35. $(x - 24)^{13}$ Find First three terms

M131435
032018

① $4x^2 = 15x + 25$

$4x^2 - 15x - 25 = 0$

$(4x + 5)(x - 5) = 0$

Let $4x + 5 = 0$ or $x - 5 = 0$

$4x + 5 - 5 = 0 - 5$ or $x - 5 + 5 = 0 + 5$

$4x = -5$ or $x = 5$

$\frac{4x}{4} = \frac{-5}{4}$

$x = -5/4$ use Quadratic formula

$4x^2 - 15x - 25 = 0$

$a = 4,\ b = -15,\ c = -25$

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

$x = \frac{-(-15) \pm \sqrt{(-15)^2 - 4(4)(-25)}}{2(4)}$

$x = \frac{15 \pm \sqrt{225 + 400}}{8}$

$x = \frac{15 \pm \sqrt{625}}{8}$

$x = \frac{15 \pm 25}{8}$

$x = \frac{15 - 25}{8}$ or $x = \frac{15 + 25}{8}$

$x = \frac{-10}{8}$ or $x = \frac{40}{8}$

$x = \frac{2(-5)}{2(4)}$ or $x = \frac{8(5)}{8}$

$4 \cdot 1$, $2 \cdot 2$; $25 \cdot 1$, $5 \cdot 5$

$\{-5/4, 5\}$

$x = \frac{-5}{4}$ or $x = 5$

(2) $1x^2 - 10x + 61 = 0$

$a=1,\ b=-10,\ c=61$

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

$$x = \frac{-(-10) \pm \sqrt{(-10)^2-4(1)(61)}}{2(1)}$$

$$x = \frac{10 \pm \sqrt{100-244}}{2}$$

$$x = \frac{10 \pm \sqrt{-144}}{2}$$

$$x = \frac{10 \pm 12i}{2}$$

$$x = 5 \pm 6i$$

$\{5-6i,\ 5+6i\}$

$x = 5-6i$ OR $x = 5+6i$

3. $3x^2 - 42x + 147 = 0$

$3(x^2 - 14x + 49) = 0$

$3(x-7)(x-7) = 0$

Let $3 \neq 0$ or $x-7=0$ or $x-7=0$

$x-7+7 = 0+7$ or $x-7+7 = 0+7$

$x = 7$ or $x = 7$

$\{7\}$

4) $\sqrt{5x+46} = x+8$

$(\sqrt{5x+46})^2 = (x+8)^2$

$5x+46 = (x+8)(x+8)$

$5x+46 = x^2+8x+8x+64$

$5x+46 = x^2+16x+64$

$0 = x^2+16x+64-5x-46$

$0 = x^2+11x+18$

$0 = (x+2)(x+9)$

18.1

9.2

$x+2=0$ OR $x+9=0$

$x+2-2=0-2$ OR $x+9-9=0-9$

$x=-2$ OR $x=-9$

Ck

$\sqrt{5x+46} = x+8$

$\sqrt{5(-2)+46} = (-2)+8$

$\sqrt{-10+46} = -2+8$

$\sqrt{36} = 6$

$6 = 6$ ✓

Good

$\sqrt{5(-9)+46} = (-9)+8$

$\sqrt{-45+46} = -9+8$

$\sqrt{1} = -1$

$1 \neq -1$

BAD

$\{-2\}$

(5) $f(x) = \begin{cases} x+2 & \text{if } x < 4 \\ x-2 & \text{if } x \geq 4 \end{cases}$ Graph

$f(x) = x+2$

$f(0) = (0)+2$

$f(0) = 0+2$

$f(0) = 2$

x	f(x)
0	2
4	6

OPEN not on Graph

$f(4) = (4)+2$

$f(4) = 4+2$

$f(4) = 6$

$f(x) = x-2$

$f(4) = (4)-2$

$f(4) = 4-2$

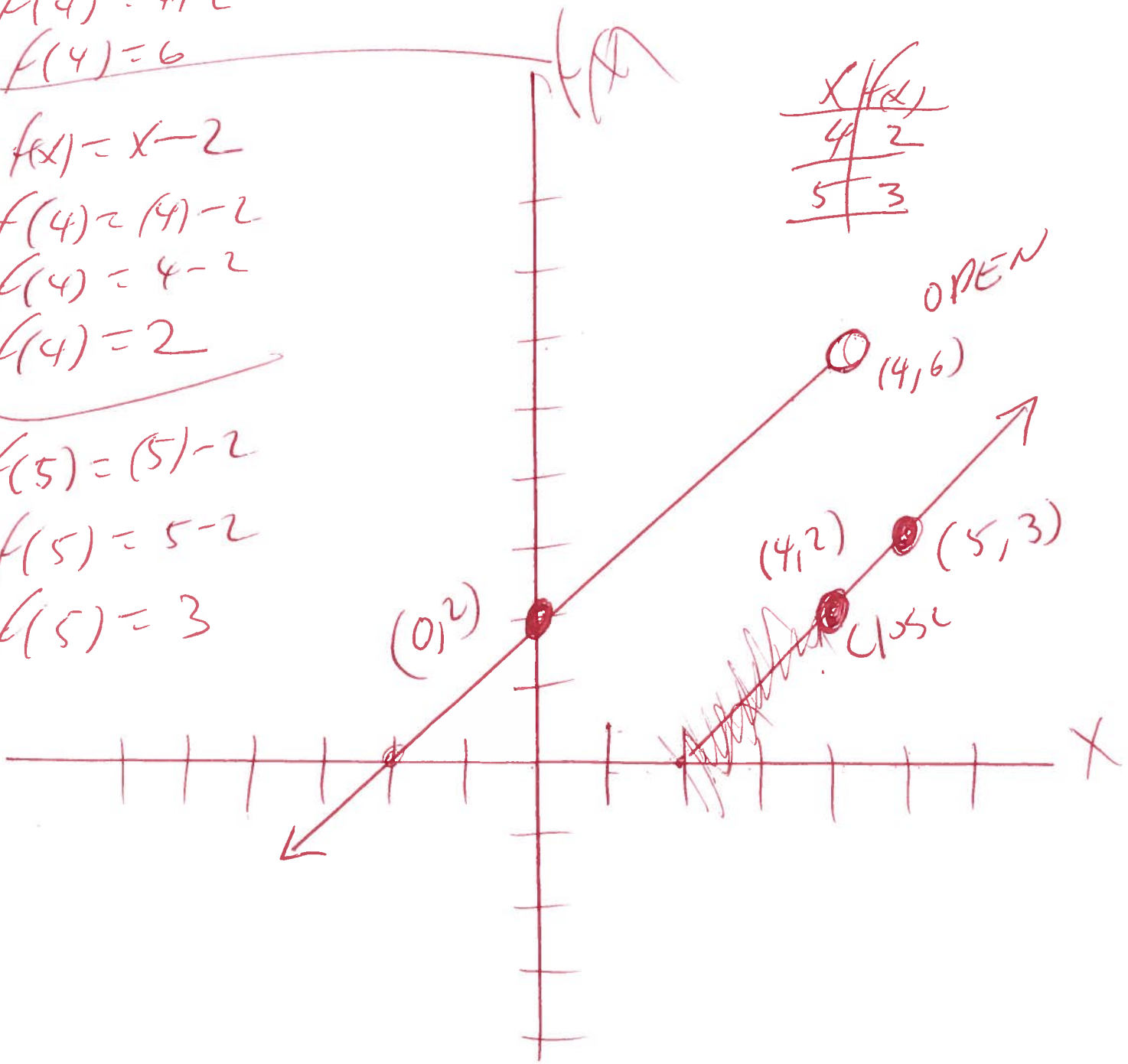
$f(4) = 2$

x	f(x)
4	2
5	3

$f(5) = (5)-2$

$f(5) = 5-2$

$f(5) = 3$



6 $f(x) = x^2 - 2x + 2$ find $\frac{f(x+h) - f(x)}{h}$

$$\frac{f(x+h) - f(x)}{h} =$$

$$\frac{((x+h)^2 - 2(x+h) + 2) - (x^2 - 2x + 2)}{h} =$$

$$\frac{(x+h)(x+h) - 2(x+h) + 2 \quad -x^2 + 2x - 2}{h} =$$

$$\frac{x^2 + xh + xh + h^2 - 2x - 2h + 2 - x^2 + 2x - 2}{h} =$$

$$\frac{x^2 + 2xh + h^2 - 2x - 2h + 2 - x^2 + 2x - 2}{h} =$$

$$\frac{2xh + h^2 - 2h}{h} =$$

$$2x + h - 2 =$$

7 $f(x) = \sqrt{20-4x}$ find domain

formula

$f(x) = \sqrt{Ax+B}$

Let $Ax+B \geq 0$

Let $20-4x \geq 0$

$20-4x-20 \geq 0-20$

$-4x \geq -20$

$\frac{-4x}{-4} \leq \frac{-20}{-4}$

divide by a negative turn the all sign around

$x \leq 5$

$(-\infty, 5]$

8) $f(x) = 2x^2 + 24x + 64$, $g(x) = x + 8$

Find $(f \cdot g)(x) =$

$f(x) \cdot g(x) =$

$(2x^2 + 24x + 64)(x + 8) =$

$2x^3 + 16x^2 + 24x^2 + 192x + 64x + 512 =$

$2x^3 + 40x^2 + 256x + 512 =$

9. $f(x) = 1 - x$, $g(x) = 2x^2 + x + 2$

Find $(f \circ g)(x)$

$f(g(x)) =$

$f(2x^2 + x + 2) =$

$1 - (2x^2 + x + 2) =$

$1 - 2x^2 - x - 2 =$

$-2x^2 - x - 1$

(10) $f(x) = 1-x$, $g(x) = 2x^2 + x + 2$

Find $(g \circ f)(x)$

$g(f(x)) =$

$g(1-x) =$

$2(1-x)^2 + (1-x) + 2 =$

$2(1-x)(1-x) + (1-x) + 2 =$

$2(1 - 1x - 1x + x^2) + (1-x) + 2 =$

$2(1 - 2x + x^2) + (1-x) + 2 =$

$2 - 4x + 2x^2 + 1 - x + 2 =$

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

11) (4, 5) and (16, 14) Find distance

$x_1\ y_1$ $x_2\ y_2$

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

$$d = \sqrt{((4) - (16))^2 + ((5) - (14))^2}$$

$$d = \sqrt{(4 - 16)^2 + (5 - 14)^2}$$

$$d = \sqrt{(-12)^2 + (-9)^2}$$

$$d = \sqrt{144 + 81}$$

$$d = \sqrt{225}$$

$$d = 15$$

(12.) (4, 10) and (2, 8) Find Midpoint

x_1 y_1 x_2 y_2

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

$$\text{Midpoint} = \left(\frac{(4)+(2)}{2}, \frac{(10)+(8)}{2}\right)$$

$$\text{Midpoint} = \left(\frac{4+2}{2}, \frac{10+8}{2}\right)$$

$$\text{Midpoint} = \left(\frac{6}{2}, \frac{18}{2}\right)$$

$$\text{Midpoint} = (3, 9)$$

13. $x^2+y^2+4x+6y+9=0$ graph

$x^2+4x+y^2+6y+9=0$

$x^2+4x \quad +y^2+6y \quad = -9$

$x^2+4x+\left(\frac{1}{2}(4)\right)^2+y^2+6y+\left(\frac{1}{2}(6)\right)^2 = -9+\left(\frac{1}{2}(4)\right)^2+\left(\frac{1}{2}(6)\right)^2$

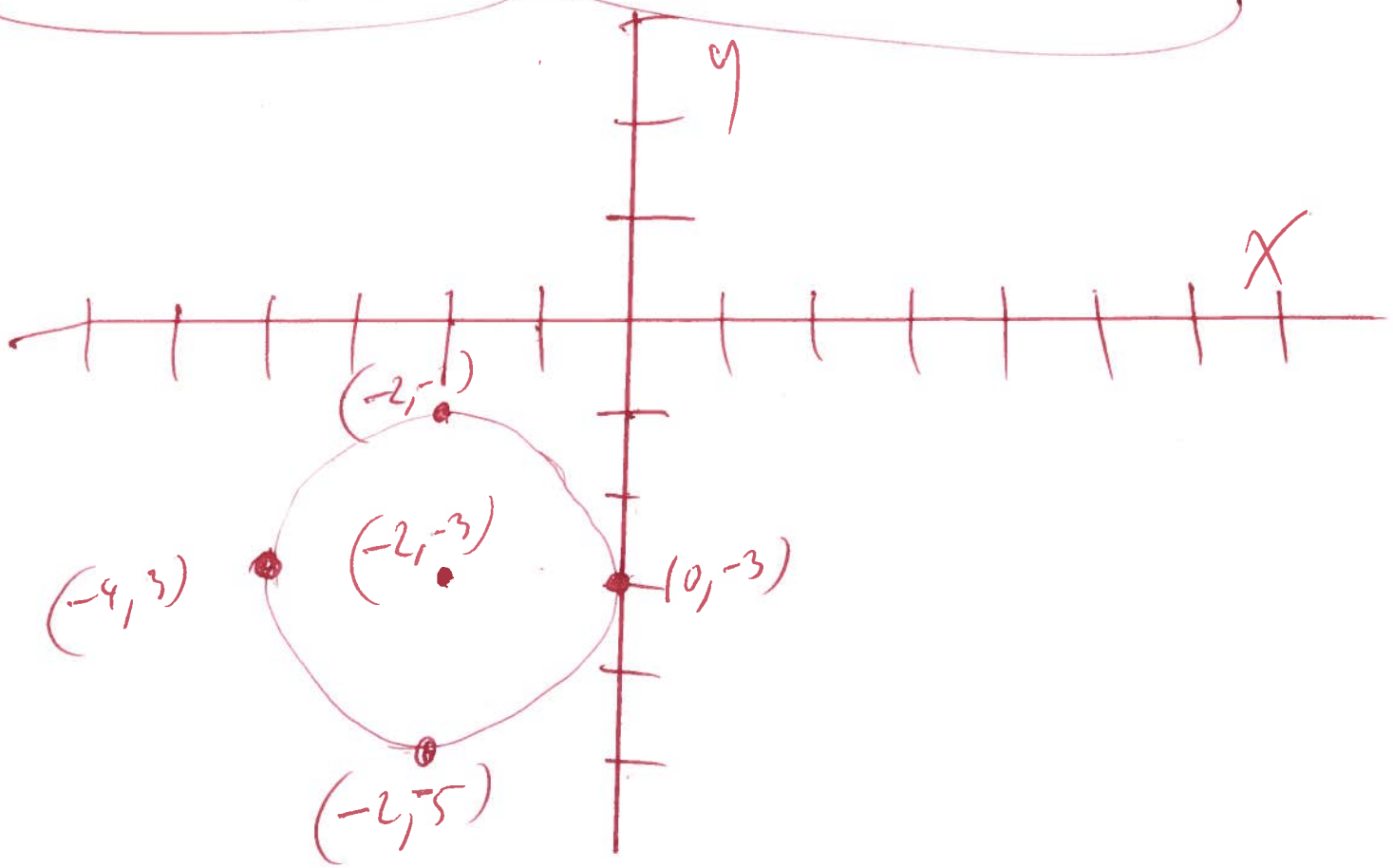
$x^2+4x+(2)^2+y^2+6y+(3)^2 = -9+(2)^2+(3)^2$

$x^2+4x+4+y^2+6y+9 = -9+4+9$

$(x+2)(x+2)+(y+3)(y+3)=4$

$(x+2)^2+(y+3)^2=4$

CENTER $=(-2,-3)$ Radius $=\sqrt{4}=2$



14. $f(x) = (x-2)^2+3$ graph

x	f(x)
1	4
2	3
3	4

$f(1) = (1-2)^2+3$

$f(1) = (-1)^2+3$

$f(1) = (-1)(-1)+3$

$f(1) = 1+3$

$f(1) = 4$

$f(2) = (2-2)^2+3$

$f(2) = (0)^2+3$

$f(2) = (0)(0)+3$

$f(2) = 0+3$

$f(2) = 3$

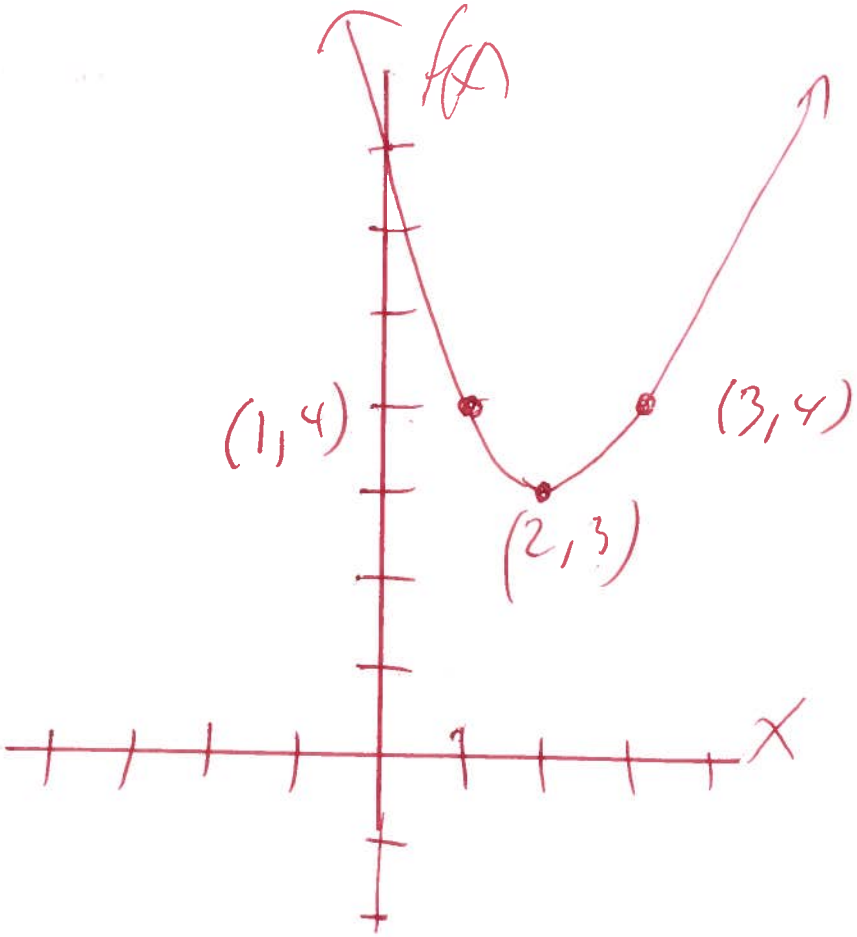
$f(3) = (3-2)^2+3$

$f(3) = (1)^2+3$

$f(3) = (1)(1)+3$

$f(3) = 1+3$

$f(3) = 4$



(15) $f(x) = x^2 - 4x - 5$ Graph

Find x-intercept let $y = 0$

$y = 0 = f(x) = x^2 - 4x - 5$

$0 = x^2 - 4x - 5$

$0 = (x+1)(x-5)$

$x+1 = 0$ or $x-5 = 0$

$x+1-1 = 0-1$ OR $x-5+5 = 0+5$

$x = -1$ OR $x = 5$ $(-1, 0)$, $(5, 0)$

Find y-intercept let $x = 0$

$f(0) = (0)^2 - 4(0) + 5$

$f(0) = (0)(0) - 4(0) - 5$

$f(0) = 0 - 0 - 5$

$f(0) = -5$ $(0, -5)$

Find VERTEX

$f(x) = 1x^2 - 4x - 5$

$a = 1, \ b = -4, \ c = -5$

$\text{Vertex} = \left(-\frac{b}{2a}, f\left(-\frac{b}{2a}\right)\right)$

$\text{Vertex} = \left(-\frac{(-4)}{2(1)}, f\left(\frac{-(-4)}{2(1)}\right)\right)$

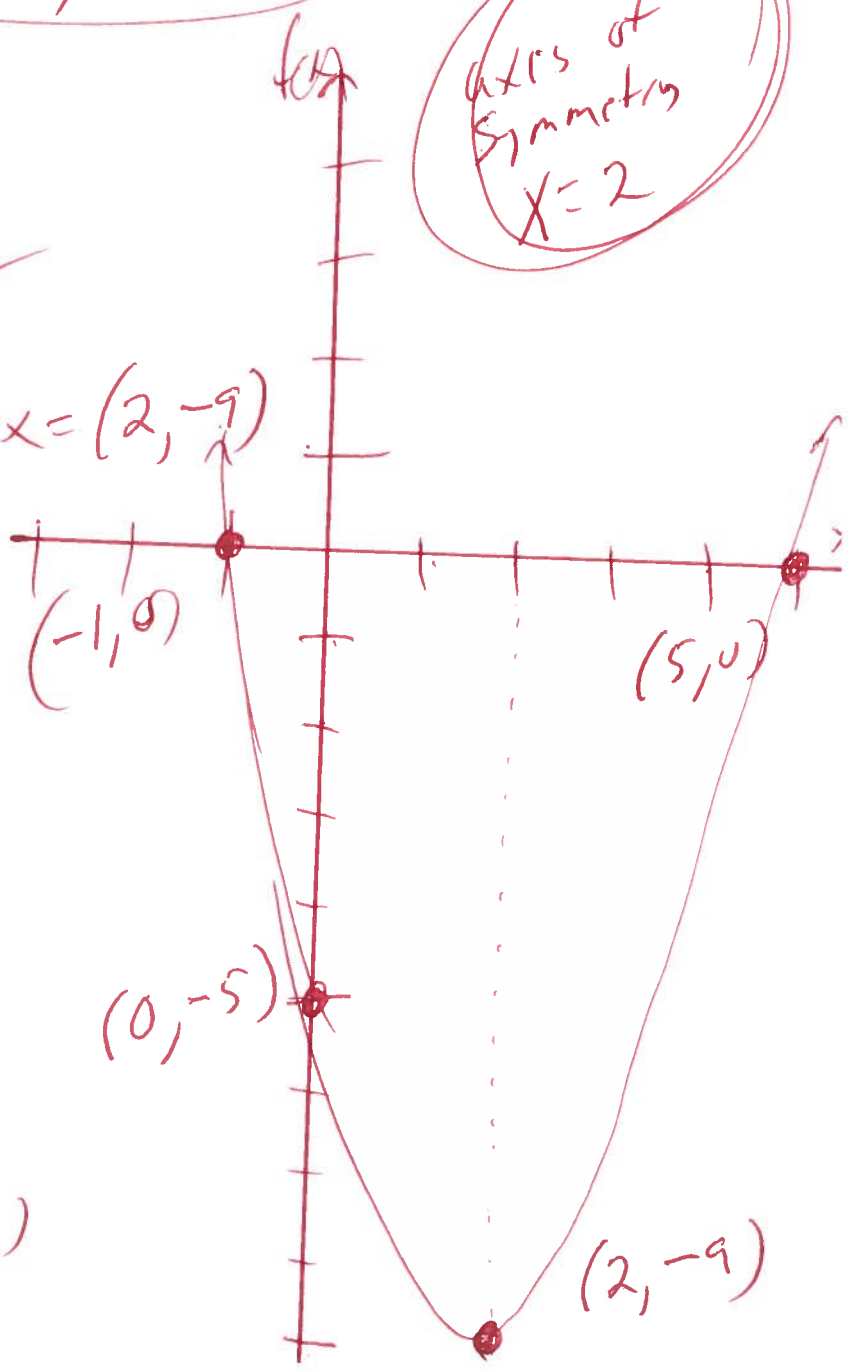
$\text{Vertex} = \left(\frac{4}{2}, f\left(\frac{4}{2}\right)\right)$

$\text{Vertex} = (2, f(2))$

$\text{Vertex} = (2, (2)^2 - 4(2) - 5)$

$\text{Vertex} = (2, (2)(2) - 4(2) - 5)$

$\text{Vertex} = (2, 4 - 8 - 5)$



(16) $f(x) = 4x - x^2 + 5$

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

find x-intercept let $y = 0$

$y = 0 = f(x) = -x^2 + 4x + 5$

$0 = -x^2 + 4x + 5$

$0 = -1(x^2 - 4x - 5)$

$0 = -1(x+1)(x-5)$

$-1 \neq 0$, $x+1 = 0$, $x - 5 = 0$

$x + 1 - 1 = 0 - 1$ $\quad x - 5 + 5 = 0 + 5$ ✓ ✓

$x = -1$ $\quad x = 5$ ✓ $\quad (-1, 0)\ (5, 0)$

find y-intercept let $x = 0$

$f(0) = -(0)^2 + 4(0) + 5$

$f(0) = -(0)(0) + 4(0) + 5$

$f(0) = -(0) + 4(0) + 5$

$f(0) = 0 + 0 + 5$ $\quad (0, 5)$

$f(0) = 5$

find VERTEX

$f(x) = -1x^2 + 4x + 5$

$a = -1,\ b = 4,\ c = 5$

$\text{Vertex} = \left(\frac{-b}{2a}, f\left(\frac{-b}{2a}\right)\right)$

$\text{Vertex} = \left(\frac{-(4)}{2(-1)}, f\left(\frac{(4)}{2(-1)}\right)\right)$

$\text{Vertex} = \left(\frac{-4}{-2}, f\left(\frac{-4}{-2}\right)\right)$

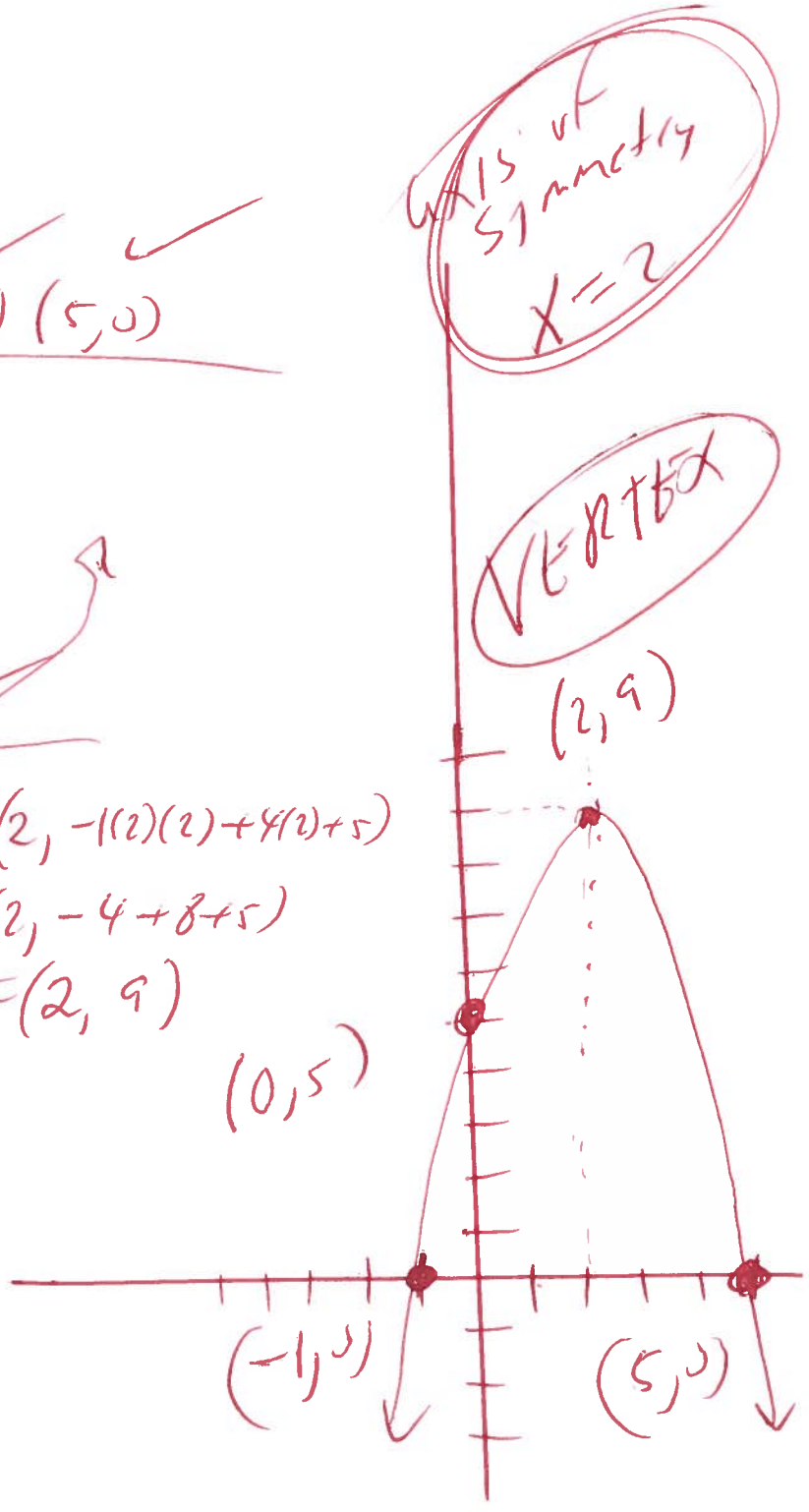
$\text{Vertex} = (2, f(2))$

$\text{Vertex} = (2, -1(2)^2 + 4(2) + 5)$

$\text{Vertex} = (2, -1(2)(2) + 4(2) + 5)$

$\text{Vertex} = (2, -4 + 8 + 5)$

$\text{Vertex} = (2, 9)$



17. $f(x) = 3x^3 - 7x^2 - 75x + 175 = 0$ Solve if $x = -5$ is a solution

$$\begin{array}{r|rrrr} -5 & 3 & -7 & -75 & 175 \\ & & -15 & 110 & -175 \\ \hline & 3 & -22 & 35 & 0 \text{ rem} \end{array}$$

$3 \cdot 1$ $35 \cdot 1$ $5 \cdot 7$ possible

$3x^2 - 22x + 35 = 0$

$(3x - 7)(x - 5) = 0$

Set $3x - 7 = 0$ OR $x - 5 = 0$

$3x - 7 + 7 = 0 + 7$ OR $x - 5 + 5 = 0 + 5$

$3x = 7$ OR $x = 5$

$\frac{3x}{3} = \frac{7}{3}$

$x = \frac{7}{3}$

$\left\{-5, \frac{7}{3}, 5\right\}$

(18) $8x^3 - 46x^2 + 31x - 5 = 0$ Solve if $x = 5$ is a sol

5	8	−46	31	−5
		40	−30	5
	8	−6	1	0

Rem

$8x^2 - 6x + 1 = 0$

$8 \cdot 1$ $1 \cdot 1$ Possible
$2 \cdot 4$

$(2x - 1)(4x - 1) = 0$

Let $2x - 1 = 0$ OR $4x - 1 = 0$

$2x - 1 + 1 = 0 + 1$ OR $4x - 1 + 1 = 0 + 1$

$2x = 1$ OR $4x = 1$

$\frac{2x}{2} = \frac{1}{2}$ OR $\frac{4x}{4} = \frac{1}{4}$

$x = \frac{1}{2}$ OR $x = \frac{1}{4}$

$\left\{5, \frac{1}{2}, \frac{1}{4}\right\}$

(19) $y = \dfrac{x-10}{3x^2+x+1}$ find horizontal asymptote

$$\lim_{x\to\infty} \frac{x-10}{3x^2+x+1} =$$

$$\lim_{x\to\infty} \left(\frac{x-10}{3x^2+x+1}\right)\frac{\frac{1}{x^2}}{\frac{1}{x^2}} =$$ mult by $\dfrac{\frac{1}{x^2}}{\frac{1}{x^2}}$

$$\lim_{x\to\infty} \frac{\frac{x}{x^2} - \frac{10}{x^2}}{\frac{3x^2}{x^2} + \frac{x}{x^2} + \frac{1}{x^2}} =$$

$$\lim_{x\to\infty} \frac{\frac{1}{x} - \frac{10}{x^2}}{3 + \frac{1}{x} + \frac{1}{x^2}} =$$

$$\frac{0-0}{3+0+0} =$$

$$\frac{0}{3} =$$

$0 =$

$y = 0$ horizontal asmptde

(20) $f(x) = \frac{2x^2 - 6x + 4}{x - 2}$ Find slant asymptote

Use synthetic division

$$\begin{array}{r|rrr} 2 & 2 & -6 & 4 \\ & & 4 & -4 \\ \hline & 2 & -2 & 0 \end{array}$$

$y = 2x - 2$

SLANT

21. $f(x) = \dfrac{18x}{3x^2+4}$ find horizontal asymptote

$$\lim_{x\to\infty} \frac{18x}{3x^2+4} =$$

$$\lim_{x\to\infty} \left(\frac{18x}{3x^2+4}\right) \frac{\frac{1}{x^2}}{\frac{1}{x^2}} =$$

$$\lim_{x\to\infty} \frac{\frac{18x}{x^2}}{\frac{3x^2}{x^2}+\frac{4}{x^2}} =$$

$$\lim_{x\to\infty} \frac{\frac{18}{x}}{3+\frac{4}{x^2}} =$$

$$\frac{0}{3+0} =$$

$$\frac{0}{3} =$$

$$0 =$$

formula

$$\lim_{x\to\infty} \frac{1}{x^n} = 0$$

$y = 0$ horizontal asymptote

22. $g(x) = \dfrac{10x^2}{5x^2+3}$ find horizontal asymptote

$$\lim_{x\to\infty} \frac{10x^2}{5x^2+3} =$$

$$\lim_{x\to\infty} \left(\frac{10x^2}{5x^2+3}\right) \frac{\frac{1}{x^2}}{\frac{1}{x^2}} =$$

$$\lim_{x\to\infty} \frac{\frac{10x^2}{x^2}}{\frac{5x^2}{x^2} + \frac{3}{x^2}} =$$

$$\lim_{x\to\infty} \frac{10}{5 + \frac{3}{x^2}} =$$

$$\frac{10}{5+0} =$$

$$\frac{10}{5} =$$

$$2 =$$

$y = 2$ horizontal asymptote

formula

$$\lim_{x\to\infty} \frac{1}{x^n} = 0$$

23. $f(x) = \log(9-x)$ find domain

formula

$f(x) = \log(Ax+B)$

$Ax+B > 0$

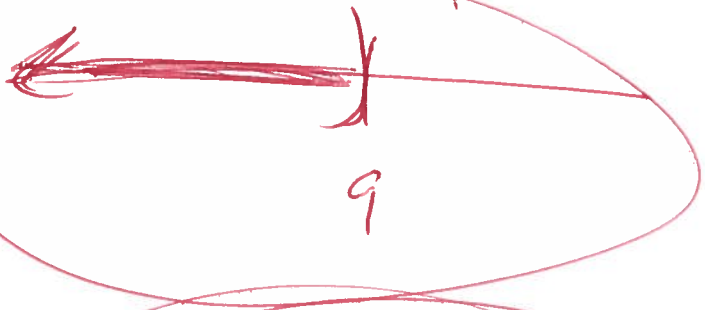
let $9-x > 0$

$9-x-9 > 0-9$

$-x > -9$

$\frac{-x}{-1} < \frac{-9}{-1}$

$x < 9$



$(-\infty, 9)$

24. $\log_b\left(\frac{x^3y}{z^7}\right)$ expand

$\log_b(x^3y) - \log_b(z^7) =$

$\log_b(x^3) + \log_b(y) - \log_b(z^7) =$

$3\log_b(x) + \log_b(y) - 7\log_b(z) =$

formula

$\log_b\left(\frac{A}{B}\right) =$

$\log_b(A) - \log_b(B)$

$\log_b(AB) =$

$\log_b(A) + \log_b(B) =$

$\log_b(A^N) =$

$N\log_b(A) =$

25.

$$9^{x+9} = 243^{x-3}$$

$$(3^2)^{x+9} = (3^5)^{x-3}$$

$$3^{2x+18} = 3^{5x-15}$$

$$2x+18 = 5x-15$$

$$2x+18-18 = 5x-15-18$$

$$2x = 5x - 33$$

$$2x-5x = 5x-33-5x$$

$$-3x = -33$$

$$\frac{-3x}{-3} = \frac{-33}{-3}$$

$$x = 11$$

$$\{11\}$$

(6) $2^{x+3} = 283$

$\ln(2^{x+3}) = \ln(283)$

$(x+3)\ln(2) = \ln(283)$

$\frac{(x+3)\ln(2)}{\ln(2)} = \frac{\ln(283)}{\ln(2)}$

$x+3 = \frac{\ln(283)}{\ln(2)}$

$x+3-3 = \frac{\ln(283)}{\ln(2)} - 3$

$x = 5.144658243$

$\{5.144658243\}$

(27) $\log_7(x) + \log_7(6x-1) = 1$

$\log_7(x)(6x-1) = 1$

$7^1 = x(6x-1)$

$7 = 6x^2 - x$

$0 = 6x^2 - x - 7$

$0 = (6x-7)(x+1)$

6·1
2·3
7·1

let $6x-7=0$ OR $x+1=0$

$6x-7+7=0+7$ OR $x+1-1=0-1$

$6x=7$ OR $x=-1$ BAD

$\frac{6x}{6} = \frac{7}{6}$

$x = \frac{7}{6}$ Good

Ck

$\log_7(x) + \log_7(6x-1) = 1$

$\log_7\left(\frac{7}{6}\right) + \log_7\left(6\left(\frac{7}{6}\right)-1\right) = 1$

$\log_7\left(\frac{7}{6}\right) + \log_7(7-1) = 1$

$\log_7\left(\frac{7}{6}\right) + \log_7(6) = 1$

Good Good

$\log_7(-1) + \log_7(6(-1)-1) = 1$

$\log_7(-1) + \log_7(-6-1) = 1$

$\log_7(-1) + \log_7(-7) = 1$

BAD BAD

$\left\{\frac{7}{6}\right\}$

28. $\log_6(x+26) - \log_6(x-9) = 2$

$\log_6\left(\frac{x+26}{x-9}\right) = 2$

$6^2 = \frac{x+26}{x-9}$

$36 = \frac{x+26}{x-9}$

$\frac{36}{1} = \frac{x+26}{x-9}$

$36(x-9) = 1(x+26)$ cross mult

$36x - 324 = 1x + 26$

$36x - 324 + 324 = 1x + 26 + 324$

$36x = 1x + 360$

$36x - 1x = 1x + 360 - 1x$

$35x = 360$

$\frac{35x}{35} = \frac{360}{35}$

$x = 10$ good

{10}

$\log_6(x+26) - \log_6(x-9) = 2$

$\log_6(10+26) - \log_6(10-9) = 2$

$\log_6(36) - \log_6(1) = 2$

good — good —

29. $\log(x) + \log(x+6) = \log(7)$

$\log(x)(x+6) = \log(7)$

$x(x+6) = 7$

$x^2 + 6x = 7$

$x^2 + 6x - 7 = 0$

$(x-1)(x+7) = 0$

Let $x-1=0$ or $x+7=0$

$x-1+1 = 0+1$ or $x+7-7 = 0-7$

$x = 1$ or $x = -7$

$x=1$ Good Ck

$x=-7$ BAD

$\log(x) + \log(x+6) = \log(7)$

$\log(1) + \log(1+6) = \log(7)$

$\log(1) + \log(7) = \log(7)$

Good Good Good

{1}

$\log(-7) + \log(-7+6) = \log(7)$

$\log(-7) + \log(-1) = \log(7)$

BAD BAD

30

$$22000 = 12500\left(1 + \frac{.0675}{2}\right)^{2x}$$

$$\frac{22000}{12500} = \frac{12500\left(1 + \frac{.0675}{2}\right)^{2x}}{12500}$$

$$1.76 = \left(1 + \frac{.0675}{2}\right)^{2x}$$

$$1.76 = (1 + .03375)^{2x}$$

$$1.76 = (1.03375)^{2x}$$

$$\ln(1.76) = \ln(1.03375)^{2x}$$

$$\ln(1.76) = 2x \ln(1.03375)$$

$$\frac{\ln(1.76)}{\ln(1.03375)} = \frac{2x \ln(1.03375)}{\ln(1.03375)}$$

$$17.03113202 = 2x$$

$$\frac{17.03113202}{2} = \frac{2x}{2}$$

8.51555601

$8.51555601 = x$

(31)

$$10 = 5e^{0.009x}$$

$$\frac{10}{5} = \frac{5e^{0.009x}}{5}$$

$$2 = e^{0.009x}$$

$$\ln(2) = \ln(e^{0.009x})$$

$$\ln(2) = 0.009x \ln(e)$$

$$\ln(2) = 0.009x(1)$$

$$\ln(2) = 0.009x$$

$$\frac{\ln(2)}{0.009} = \frac{0.009x}{0.009}$$

77.0163534

77.0163534 = x

34.

$$x+y+9z=22$$
$$x+y+3z=10$$
$$x+6y-6z=-3$$

Use graphing calculator

2ND, matrix, Edit, [A], 3x4,

$$\begin{bmatrix} 1 & 1 & 9 & 22 \\ 1 & 1 & 3 & 10 \\ 1 & 6 & -6 & -3 \end{bmatrix}$$

2ND Quit

2ND, matrix, Math, rref, 2ND matrix

rref([A]) =

Enter

$$\begin{bmatrix} 1 & 0 & 0 & 3 \\ 0 & 1 & 0 & 1 \\ 0 & 0 & 1 & 2 \end{bmatrix} \begin{matrix} x \\ y \\ z \end{matrix}$$

$(x, y, z) = (3, 1, 2)$

33. $\sum_{x=1}^{4} x(x+1) =$

$1(1+1) + 2(2+1) + 3(3+1) + 4(4+1) =$

$1(2) + 2(3) + 3(4) + 4(5) =$

$2 + 6 + 12 + 20 =$

$40 =$

OR use graphing CALCulator

39. $(2x+y)^3 =$

$${}_3C_0(2x)^3(y)^0 + {}_3C_1(2x)^2(y)^1 + {}_3C_2(2x)^1(y)^2 + {}_3C_3(2x)^0(y)^3 =$$

$$(1)(2^3x^3)(1) + (3)(2^2x^2)(y) + (3)(2^1x^1)(y^2) + (1)(1)(y^3) =$$

$$(1)(8x^3)(1) + (3)(4x^2)(y) + (3)(2x)(y^2) + (1)(1)(y^3) =$$

$$8x^3 + 12x^2y + 6xy^2 + y^3 =$$

use a graphing calculator

3, Math, PRB, nCr, enter, 0, enter = 1

3, Math, PRB, nCr, enter, 1, enter = 3

3, Math, PRB, nCr, enter, 2, enter = 3

3, Math, PRB, nCr, enter, 3, enter = 1

35 $(x-2y)^{13}$ 1st three terms

$$\binom{13}{0}(x)^{13}(-2y)^{0} + \binom{13}{1}(x)^{12}(-2y)^{1} + \binom{13}{2}(x)^{11}(-2y)^{2} =$$

$$(1)(x^{13})(1) + (13)(x^{12})(-2y)^{1} + (78)(x^{11})(-2y)(-2y) =$$

$$(1)(x^{13})(1) + (13)(x^{12})(-2y) + (78)(x^{11})(4y^{2}) =$$

$$x^{13} - 26x^{12}y + 312x^{11}y^{2} =$$

Use a graphing calculator

13, ~~Math, PRB, nCr~~, enter, 0, enter = 1

13, Math, PRB, nCr, enter, 1, enter = 13

13, Math, PRB, nCr, enter, 2, enter = 78