

1.  $14x^2 + 3x - 2 = 0$

2.  $x^2 - 10x + 41 = 0$

3.  $2x^2 - 32x + 128 = 0$

4.  $\sqrt{5x+41} = x+7$

5.  $f(x) = \begin{cases} x+4 & \text{if } x < 3 \\ x-4 & \text{if } x \geq 3 \end{cases}$  graph

6.  $f(x) = x^2 - 7x + 2$  find  $\frac{f(x+h) - f(x)}{h}$

7.  $f(x) = \sqrt{18-3x}$  find domain

8.  $f(x) = 4x^2 + 20x + 24$ ,  $g(x) = x+3$  find  $(f-g)(x)$

9.  $f(x) = 4x^2 + 20x + 24$ ,  $g(x) = x+3$  find  $(f \circ g)(x)$

10.  $f(x) = 3-x$  and  $g(x) = 3x^2 + x + 5$  find  $(f \circ g)(x)$

11.  $f(x) = 3-x$  and  $g(x) = 3x^2 + x + 5$  find  $(g \circ f)(x)$

12. find distance  $(3, 8)$  and  $(8, 20)$

13. find midpoint  $(10, 8)$  and  $(2, 6)$

14.  $x^2 + y^2 + 10x + 6y + 33 = 0$  graph

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

16.  $f(x) = x^2 + 4x + 3$  graph

17.  $f(x) = 2x - x^2 + 8$  graph

18.  $x^3 - 5x^2 + 2x + 8 = 0$  solve and graph

19.  $3x^3 - 7x^2 - 75x + 175 = 0$  solve, given  $x=5$  is a zero

20.  $f(x) = \frac{x-10}{3x^2+x+1}$  find horizontal asymptote

21.  $f(x) = \frac{5x^2-4x+7}{x-6}$  find the slant

22.  $f(x) = \frac{28x^2}{7x^2+6}$  find the horizontal asymptote

23.  $f(x) = \text{Log}(10-x)$  find domain

24.  $\text{Log}_b\left(\frac{x^2}{27}\right)$  expand

25.  $\ln\left(\frac{x^5\sqrt{x^2+5}}{(x+5)^3}\right)$  expand

26.  $16^{x+8} = 256^{x-4}$  solve

27.  $4^{x+1} = 471$  solve

28.  $\text{Log}_9(x) + \text{Log}_9(8x-1) = 1$  solve

29.  $\text{Log}_4(x+13) - \text{Log}_4(x-2) = 2$  solve

30. solve  
 $x+y+7z=12$   
 $x+y+5z=10$   
 $x-8y-2z=-24$

31.

Write the first three terms

~~...~~  
 $(x+2)^9$

Math 13/4/31  
03-06-18

$$① \quad 14x^2 + 3x - 2 = 0$$

$$(2x+1)(7x-2) = 0$$

$$\text{Let } 2x+1=0 \quad \text{OR} \quad 7x-2=0$$

$$2x+1-1=0-1 \quad \text{OR} \quad 7x-2+2=0+2$$

$$2x = -1 \quad \text{OR} \quad 7x = 2$$

$$\frac{2x}{2} = \frac{-1}{2} \quad \text{OR} \quad \frac{7x}{7} = \frac{2}{7}$$

$$x = -\frac{1}{2} \quad \text{OR} \quad x = \frac{2}{7}$$

Use Quadratic formula

$$14x^2 + 3x - 2 = 0$$

$$a=14, \quad b=3, \quad c=-2$$

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

$$x = \frac{-3 \pm \sqrt{3^2 - 4(14)(-2)}}{2(14)}$$

$$x = \frac{-3 \pm \sqrt{9 + 112}}{28}$$

$$x = \frac{-3 \pm \sqrt{121}}{28}$$

$$x = \frac{-3 \pm 11}{28}$$

$$x = \frac{-3-11}{28} \quad \text{OR} \quad x = \frac{-3+11}{28}$$

$$x = \frac{-14}{28} \quad \text{OR} \quad x = \frac{8}{28}$$

$$x = \frac{14(-1)}{14(2)} \quad \text{OR} \quad x = \frac{4(2)}{4(7)}$$

$$x = -\frac{1}{2}$$

$$\text{OR} \quad x = \frac{2}{7}$$

②

$$\left\{ -\frac{1}{2}, \frac{2}{7} \right\}$$

$$2) |x^2 - 10x + 41| = 0$$

$$a=1, b=-10, c=41$$

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

$$x = \frac{-(-10) \pm \sqrt{(-10)^2 - 4(1)(41)}}{2(1)}$$

$$x = \frac{10 \pm \sqrt{100 - 164}}{2}$$

$$x = \frac{10 \pm \sqrt{-64}}{2}$$

$$x = \frac{10 \pm 8i}{2}$$

$$x = 5 \pm 4i$$

$$x = 5 + 4i$$

$$\text{OR } x = 5 - 4i$$

$$\{5 + 4i, 5 - 4i\}$$

3!

$$3) \quad 2x^2 - 32x + 128 = 0$$

$$2(x^2 - 16x + 64) = 0$$

$$2(x-8)(x-8) = 0$$

$$\text{wt } 2 \neq 0 \quad \text{OR } x-8=0 \quad \text{OR } x-8=0$$

$$x-8+8=0+8 \quad \text{OR } x-8+8=0+8$$

$$x=8 \quad \text{OR } x=8$$

4

USE Quadratic formula

$$2x^2 - 32x + 128 = 0$$

$$a=2, \quad b=-32, \quad c=128$$

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

$$x = \frac{-(-32) \pm \sqrt{(-32)^2 - 4(2)(128)}}{2(2)}$$

$$x = \frac{32 \pm \sqrt{1024 - 1024}}{4}$$

$$x = \frac{32 \pm \sqrt{0}}{4}$$

$$x = \frac{32 \pm 0}{4}$$

$$x = \frac{32-0}{4} \quad \text{OR} \quad x = \frac{32+0}{4}$$

$$x = \frac{32}{4} \quad \text{OR} \quad x = \frac{32}{4}$$

$$x=8 \quad \text{OR} \quad x=8$$

{8}

$$\textcircled{4} \sqrt{5x+41} = x+7$$

$$(\sqrt{5x+41})^2 = (x+7)^2$$

$$5x+41 = (x+7)(x+7)$$

$$5x+41 = x^2 + 7x + 7x + 49$$

$$5x+41 = x^2 + 14x + 49$$

$$0 = x^2 + 14x + 49 - 5x - 41$$

$$0 = x^2 + 9x + 8$$

$$0 = (x+1)(x+8)$$

$$\text{Let } x+1=0 \quad \text{OR} \quad x+8=0$$

$$x+1-1=0-1 \quad \text{OR} \quad x+8-8=0-8$$

$$\textcircled{x=-1}$$

$$\text{OR } \textcircled{\cancel{x=-8}}$$

$$\text{ck } \sqrt{5x+41} = x+7$$

$$\sqrt{5(-1)+41} = (-1)+7$$

$$\sqrt{-5+41} = -1+7$$

$$\sqrt{36} = 6$$

$$6 = 6 \quad \checkmark$$

Good

$$\text{ck } \sqrt{5x+41} = x+7$$

$$\sqrt{5(-8)+41} = (-8)+7$$

$$\sqrt{-40+41} = -8+7$$

$$\sqrt{1} = -1$$

$$1 \neq -1$$

BAD

$$\{x=-1\}$$

50

5. graph

6

$$f(x) = \begin{cases} x+4 & \text{if } x < 3 \text{ OPEN} \\ x-4 & \text{if } x \geq 3 \text{ Close} \end{cases}$$

x	f(x)
0	4
3	7

open point

$$f(x) = x+4$$

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

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

$$f(0) = 4$$

$$f(3) = (3) + 4$$

$$f(3) = 3 + 4$$

$$f(3) = 7$$

$$f(x) = x-4$$

$$f(3) = (3) - 4$$

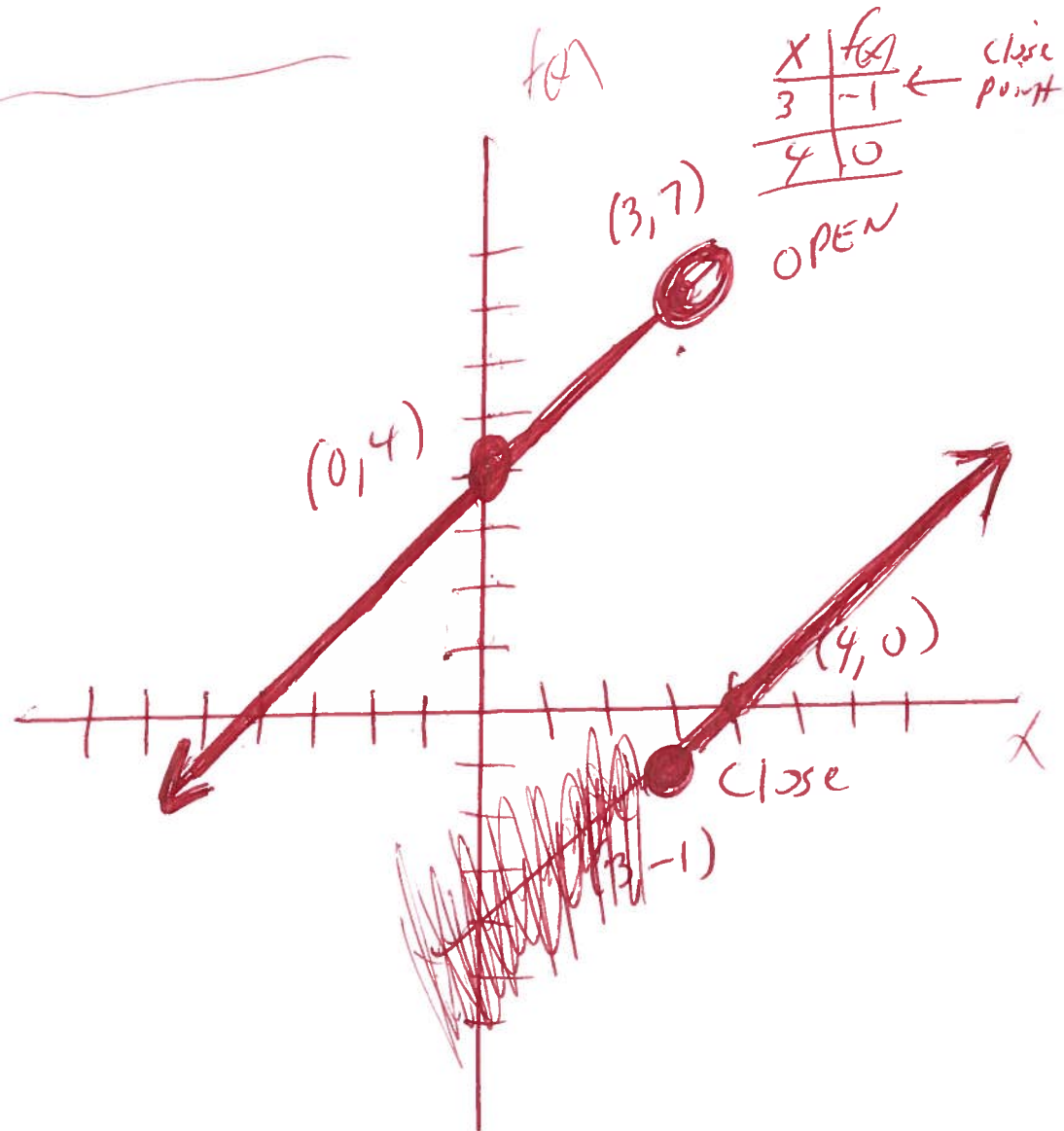
$$f(3) = 3 - 4$$

$$f(3) = -1$$

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

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

$$f(4) = 0$$



$$6. f(x) = x^2 - 7x + 2$$

7

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

$$\frac{((x+h)^2 - 7(x+h) + 2) - (x^2 - 7x + 2)}{h} =$$

$$\frac{(x+h)(x+h) - 7x - 7h + 2 - x^2 + 7x - 2}{h} =$$

$$\frac{x^2 + xh + xh + h^2 - 7x - 7h + 2 - x^2 + 7x - 2}{h} =$$

$$\frac{x^2 + 2xh + h^2 - 7x - 7h + 2 - x^2 + 7x - 2}{h} =$$

$$\frac{2xh + h^2 - 7h}{h} =$$

$$\frac{h(2x + h - 7)}{h} = \text{factor}$$

$$2x + h - 7 =$$

7.  $f(x) = \sqrt{18-3x}$

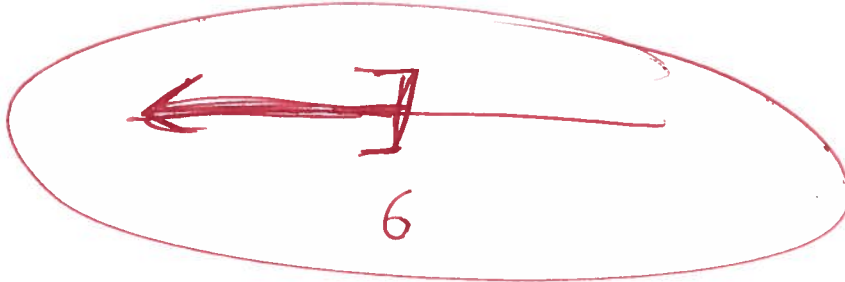
set  $18-3x \geq 0$

~~$18-3x-18 \geq 0-18$~~

$-3x \geq -18$

$\frac{-3x}{-3} \leq \frac{-18}{-3}$

$x \leq 6$



$(-\infty, 6]$

Formula  
domain

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

set  $Ax+B \geq 0$

8!



8.  $f(x) = 4x^2 + 20x + 24$ ,  $g(x) = x + 3$

find  $(f-g)(x) =$

$$f(x) - g(x) =$$

$$(4x^2 + 20x + 24) - (x + 3) =$$

$$4x^2 + 20x + 24 - x - 3 =$$

$$4x^2 + 19x + 21 =$$

9

9.  $f(x) = 4x^2 + 20x + 24$ ,  $g(x) = x + 3$

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

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

$(4x^2 + 20x + 24)(x + 3) =$

$4x^3 + 12x^2 + 20x^2 + 60x + 24x + 72 =$

$4x^3 + 32x^2 + 84x + 72 =$

10

10  $f(x) = 3 - x$  and  $g(x) = 3x^2 + x + 5$

find  $(f \circ g)(x) =$

$$f(g(x)) =$$

$$f(3x^2 + x + 5) =$$

$$3 - (3x^2 + x + 5) =$$

$$3 - 3x^2 - x - 5 =$$

$$\underline{-3x^2 - x - 2 =}$$



11.  $f(x) = 3 - x$  and  $g(x) = 3x^2 + x + 5$

find  $(g \circ f)(x) =$

$g(f(x)) =$

$g(3 - x) =$

$3(3 - x)^2 + (3 - x) + 5 =$

$3(3 - x)(3 - x) + (3 - x) + 5 =$

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

$3(9 - 6x + x^2) + (3 - x) + 5 =$

$3(x^2 - 6x + 9) + (3 - x) + 5 =$

$3x^2 - 18x + 27 + 3 - x + 5 =$

$(3x^2 - 19x + 35 =$

12

12. Find distance  $(3, 8)$  and  $(8, 20)$   
 $x_1$   $y_1$   $x_2$   $y_2$

13.

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

$$d = \sqrt{(3 - 8)^2 + (8 - 20)^2}$$

$$d = \sqrt{(3 - 8)^2 + (8 - 20)^2}$$

$$d = \sqrt{(-5)^2 + (-12)^2}$$

$$d = \sqrt{25 + 144}$$

$$d = \sqrt{169}$$

$$d = 13$$

(13) Find Midpoint  $(10, 8)$  and  $(2, 6)$   
 $x_1 \quad y_1 \quad x_2 \quad y_2$

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

$$\text{Midpoint} = \left( \frac{(10) + (2)}{2}, \frac{(8) + (6)}{2} \right)$$

$$\text{Midpoint} = \left( \frac{10+2}{2}, \frac{8+6}{2} \right)$$

$$\text{Midpoint} = \left( \frac{12}{2}, \frac{14}{2} \right)$$

$$\text{Midpoint} = (6, 7)$$

(14)

14  $x^2 + y^2 + 10x + 6y + 33 = 0$  graph 150

$$x^2 + 10x + y^2 + 6y = -33$$

$$x^2 + 10x + \left(\frac{1}{2}(10)\right)^2 + y^2 + 6y + \left(\frac{1}{2}(6)\right)^2 = -33 + \left(\frac{1}{2}(10)\right)^2 + \left(\frac{1}{2}(6)\right)^2$$

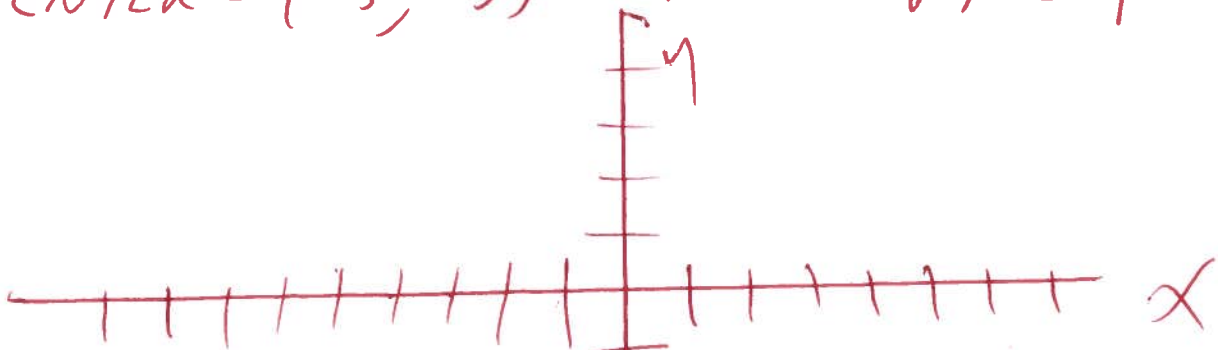
$$x^2 + 10x + (5)^2 + y^2 + 6y + (3)^2 = -33 + (5)^2 + (3)^2$$

$$x^2 + 10x + 25 + y^2 + 6y + 9 = -33 + 25 + 9$$

$$(x+5)(x+5) + (y+3)(y+3) = 1$$

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

CENTER =  $(-5, -3)$       Radius =  $\sqrt{1} = 1$



$(-5, -3)$   
CENTER

Radius = 1

15. graph

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

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

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

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

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

$$f(2) = 3$$

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

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

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

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

$$f(3) = 2$$

$$f(4) = (4-3)^2 + 2$$

$$f(4) = (1)^2 + 2$$

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

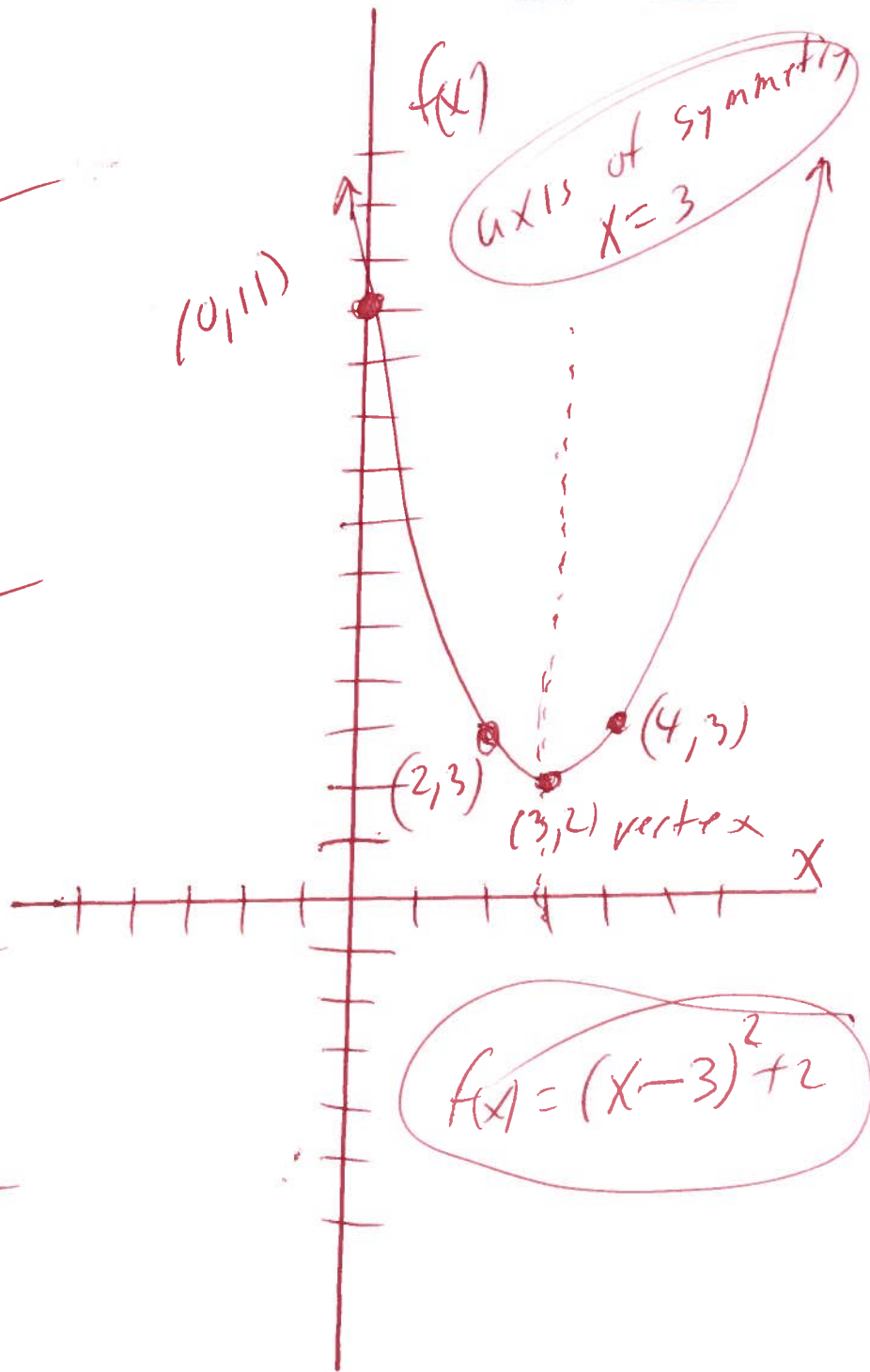
$$f(4) = 1 + 2$$

$$f(4) = 3$$

Notice  
graph  
shift right 3  
~~shift right 3~~  
shift up 2

x	f(x)
2	3
3	2
4	3

16.





16 graph

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

0 =  $x^2 + 4x + 3$  Find x-intercept let  $y = 0$

$$0 = (x+1)(x+3)$$

$$x+1=0 \text{ OR } x+3=0$$

$$x+1-1=0-1 \text{ OR } x+3-3=0-3$$

$$x = -1 \text{ OR } x = -3$$

$$(-1, 0) \text{ OR } (-3, 0) \text{ x-intercepts}$$

Find y-intercept let  $x = 0$

$$f(0) = (0)^2 + 4(0) + 3 = (0)(0) + 4(0) + 3 = 0 + 0 + 3 = 3$$

vertex  $f(x) = 1x^2 + 4x + 3$   
 $a=1, b=4, c=3$

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

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

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

$$= (-2, f(-2))$$

$$= (-2, (-2)^2 + 4(-2) + 3)$$

$$= (-2, (-2)(-2) + 4(-2) + 3)$$

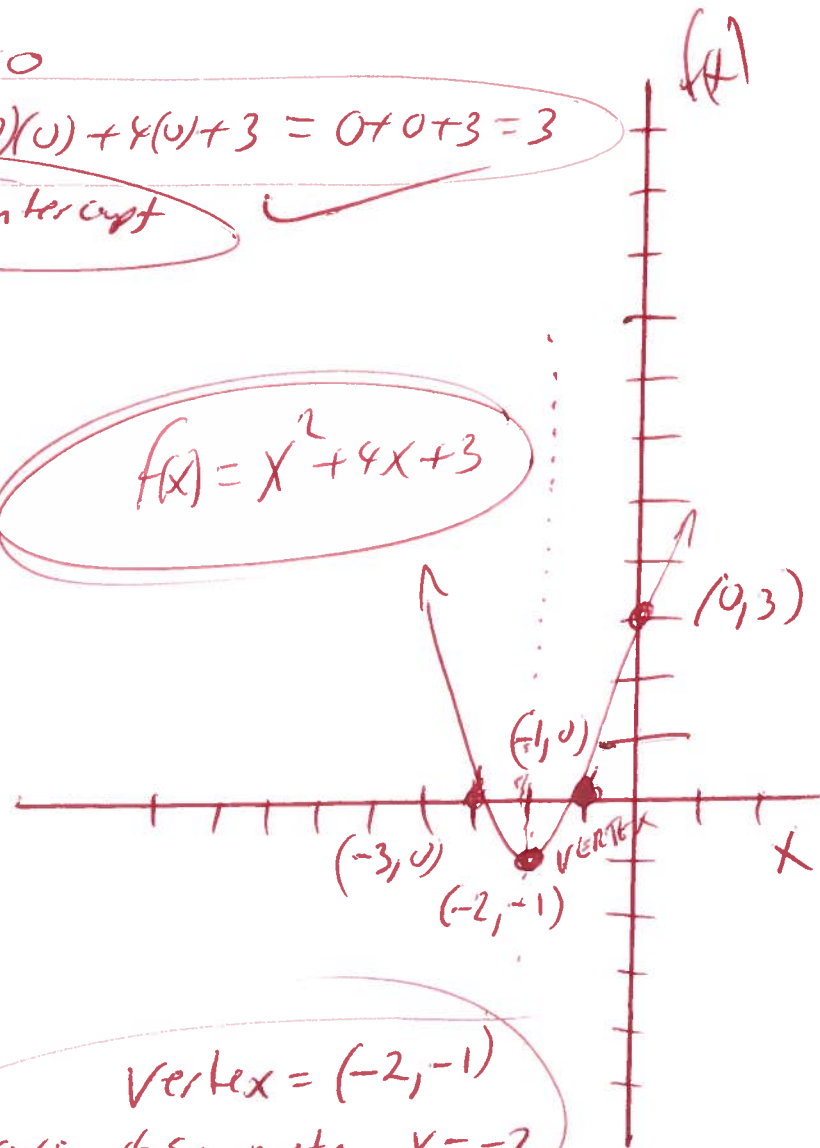
$$= (-2, 4 - 8 + 3)$$

$$= (-2, -4 + 3)$$

$$= (-2, -1)$$

vertex

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



vertex =  $(-2, -1)$   
axis of symmetry  $x = -2$

17

(17) graph

$$f(x) = 2x - x^2 + 8$$

$$y = f(x) = -x^2 + 2x + 8$$

$$0 = -x^2 + 2x + 8 \text{ Find } x\text{-intercept } \text{Let } y = 0$$

$$-1(0) = -1(-x^2 + 2x + 8)$$

$$0 = x^2 - 2x - 8$$

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

$$\text{Let } x+2=0 \text{ OR } x-4=0$$

$$x+2-2=0-2 \text{ OR } x-4+4=0+4$$

$$x = -2 \text{ OR } x = 4$$

$(-2, 0)$  OR  $(4, 0)$  x-intercepts

find the y-intercept let  $x=0$

$$f(0) = -(0)^2 + 2(0) + 8$$

$$f(0) = -(0)(0) + 2(0) + 8$$

$$f(0) = 0 + 0 + 8 \quad (0, 8)$$

$$f(0) = 8 \quad \text{y-intercept}$$

find vertex  $f(x) = -x^2 + 2x + 8$

$$\text{vertex} = \left(-\frac{b}{2a}, f\left(-\frac{b}{2a}\right)\right) \quad a = -1, b = 2, c = 8$$

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

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

$$= (1, f(1))$$

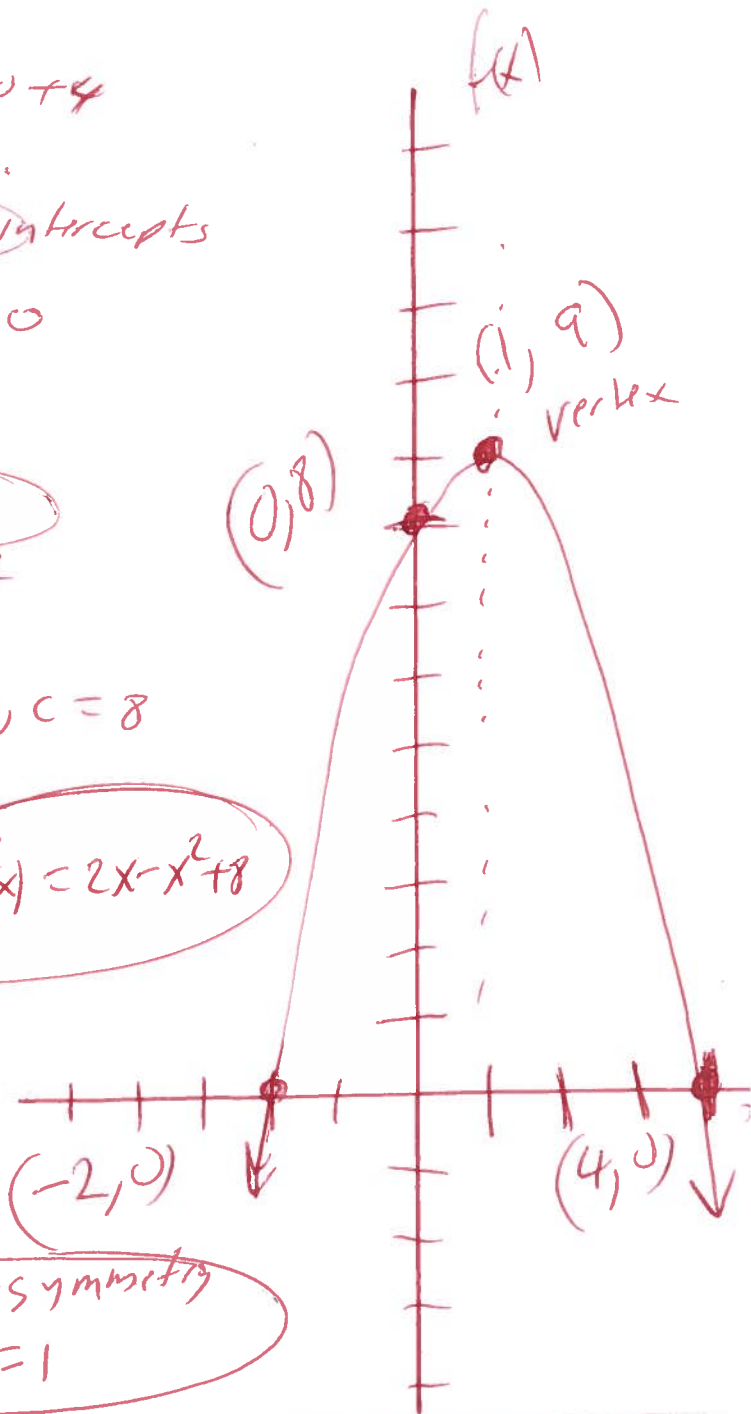
$$= (1, -(1)^2 + 2(1) + 8)$$

$$= (1, -(1)(1) + 2(1) + 8)$$

$$= (1, -1 + 2 + 8)$$

$$= (1, 9) \text{ vertex}$$

axis of symmetry  
 $x = 1$



(18)  $x^3 - 5x^2 + 2x + 8 = 0$

$$\begin{array}{r|rrrr} -1 & 1 & -5 & 2 & 8 \\ & & -1 & 6 & -8 \\ \hline & 1 & -6 & 8 & 0 \text{ rem} \end{array}$$

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

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

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

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

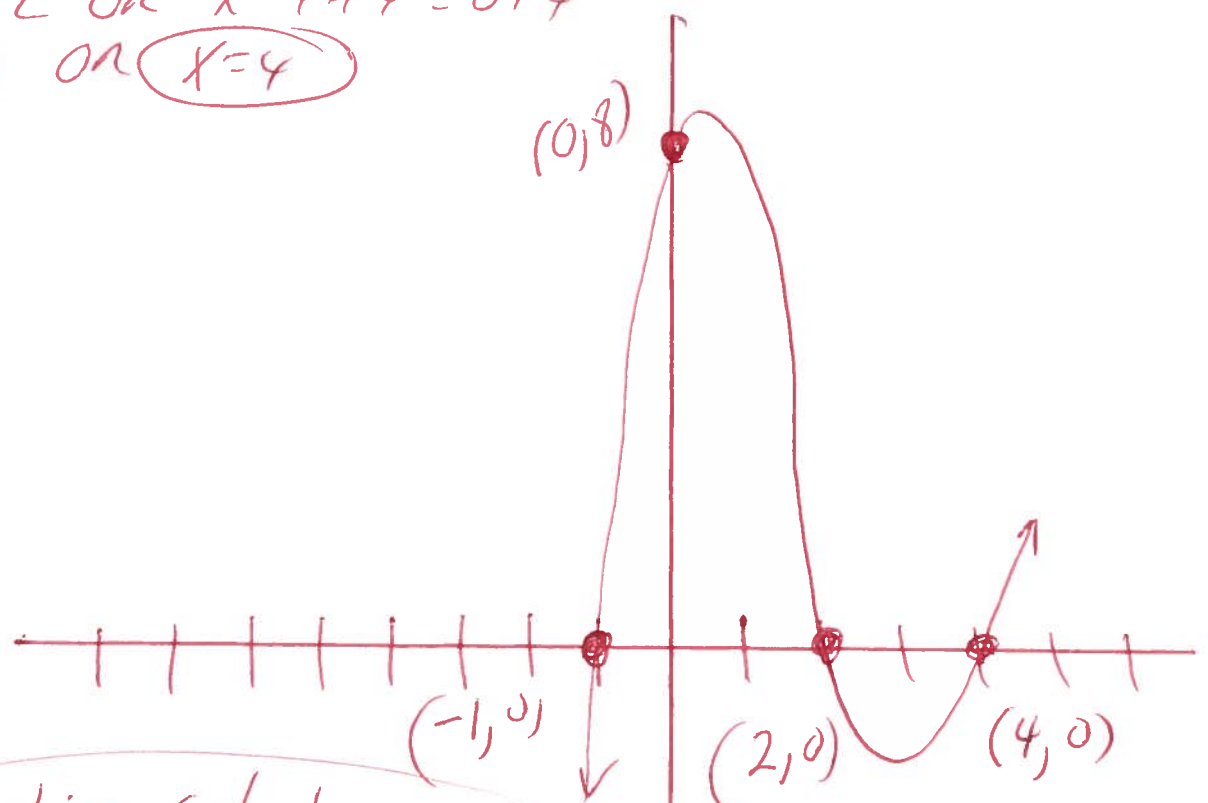
$x=2$  OR  $x=4$

Possible  
 $\pm 8, \pm 4, \pm 2, \pm 1$

Graph

(19)

$\{-1, 2, 4\}$



Use graphing calculator

$$y_1 = x^3 - 5x^2 + 2x + 8$$

$x_{min} = -12$   
 $x_{max} = 12$   
 $x_{scl} = 1$   
 $y_{min} = -10$   
 $y_{max} = 10$   
 $y_{scl} = 1$

$$(19) \quad 3x^3 - 7x^2 - 75x + 175 = 0$$

Solve given  
 $x=5$  is a zero

$$\begin{array}{r|rrrr} 5 & 3 & -7 & -75 & 175 \\ & & 15 & 40 & -175 \\ \hline & 3 & 8 & -35 & 0 \text{ rem} \end{array}$$

(20)

$$\text{let } 3x^2 + 8x - 35 = 0$$

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

$$3x-7=0 \quad \text{OR} \quad x+5=0$$

$$3x-7+7=0+7 \quad \text{OR} \quad x+5-5=0-5$$

$$3x=7 \quad \text{OR} \quad x=-5$$

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

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

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

Possible  
3.1  
35.1  
7.5

20

$$f(x) = \frac{x-10}{3x^2+x+1}$$

find horizontal asymptote

21

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

$$\lim_{x \rightarrow \infty} \left( \frac{x-10}{3x^2+x+1} \right) \frac{\frac{1}{x^2}}{\frac{1}{x^2}}$$

$$\lim_{x \rightarrow \infty} \left( \frac{\frac{x}{x^2} - \frac{10}{x^2}}{\frac{3x^2}{x^2} + \frac{x}{x^2} + \frac{1}{x^2}} \right)$$

$$\lim_{x \rightarrow \infty} \left( \frac{\frac{1}{x} - \frac{10}{x^2}}{3 + \frac{x}{x} + \frac{1}{x^2}} \right)$$

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

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

$$0 =$$

$$y = 0$$

horizontal asymptote

formula

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

(21)  $f(x) = \frac{5x^2 - 4x + 7}{x - 6}$

↙

$$\begin{array}{r|rrr} 6 & 5 & -4 & 7 \\ & & 30 & 130 \\ \hline & 5 & 26 & 137 \text{ Rem} \end{array}$$

$$y = 5x + 26$$

find SLANT (22)

use synthetic division

SLANT

22.  $f(x) = \frac{28x^2}{7x^2+6}$  find horizontal asymptote

$$\lim_{x \rightarrow \infty} \frac{28x^2}{7x^2+6} =$$

$$\lim_{x \rightarrow \infty} \left( \frac{28x^2}{7x^2+6} \right) \frac{\frac{1}{x^2}}{\frac{1}{x^2}} =$$

$$\lim_{x \rightarrow \infty} \left( \frac{\frac{28x^2}{x^2}}{\frac{7x^2}{x^2} + \frac{6}{x^2}} \right) =$$

$$\lim_{x \rightarrow \infty} \left( \frac{28}{7 + \frac{6}{x^2}} \right) =$$

$$\frac{28}{7+0} =$$

$$\frac{28}{7} =$$

$$4 =$$

$$y = 4$$

horizontal asymptote

23!

formula  
 $\lim_{x \rightarrow \infty} \frac{1}{x^n} =$

23.  $f(x) = \log(10-x)$  find domain (24)

$$\text{let } 10-x > 0$$

$$10-x-10 > 0-10$$

$$-x > -10$$

$$\frac{-x}{-1} < \frac{-10}{-1}$$

$$x < 10$$



$$(-\infty, 10)$$

formula  
 $f(x) = \log(Ax+B)$   
set  $Ax+B > 0$



(24)  $\log_b \left( \frac{x^2 y}{z^7} \right) =$  Expand formula (24)

$$\log_b (x^2 y) - \log_b (z^7) =$$

$$\log_b (x^2) + \log_b (y) - \log_b (z^7) =$$

$$2 \log_b (x) + \log_b (y) - 7 \log_b (z) =$$

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

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

$$\log_b (AB) =$$

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

$$\log_b (A^N) =$$

$$N \log_b (A) =$$

25)  $\ln\left(\frac{x^5 \sqrt{x^2+5}}{(x+5)^3}\right) =$  expand

26

$$\ln(x^5 \sqrt{x^2+5}) - \ln(x+5)^3 =$$

$$\ln(x^5) + \ln \sqrt{x^2+5} - \ln(x+5)^3 =$$

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

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

Formula

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

$$\ln(AB) = \ln(A) + \ln(B)$$

$$\ln(A^N) = N \ln(A)$$

26

$$16^{x+8} = 256^{x-4}$$

$$(4^2)^{x+8} = (4^4)^{x-4}$$

$$4^{2x+16} = 4^{4x-16}$$

~~$$4^{2x+16} = 4^{4x-16}$$~~

$$2x+16 = 4x-16$$

$$2x + \cancel{16} - \cancel{16} = 4x - 16 - 16$$

$$2x = 4x - 32$$

$$2x - 4x = \cancel{4x} - 32 - \cancel{4x}$$

$$-2x = -32$$

$$\frac{-2x}{-2} = \frac{-32}{-2}$$

$$x = 16$$

Solve (27)

formula  
 $A^x = A^y$  then  
 $x = y$

$$(27) \quad 4^{x+1} = 471$$

$$\ln(4^{x+1}) = \ln(471)$$

$$(x+1) \ln(4) = \ln(471)$$

$$\frac{(x+1) \ln(4)}{\ln(4)} = \frac{\ln(471)}{\ln(4)}$$

$$x+1 = \frac{\ln(471)}{\ln(4)}$$

$$x+1 - 1 = \frac{\ln(471)}{\ln(4)} - 1$$

$$x = \frac{\ln(471)}{\ln(4)} - 1$$

$$x = 3.439791625$$

OR

Round

$$x = 3.44$$

(28)

formula

$$\ln(A^N) =$$

$$N \ln(A) =$$

$$\textcircled{28} \quad \log_9(x) + \log_9(8x-1) = 1$$

$$\log_9(x)(8x-1) = 1$$

$$9^1 = x(8x-1)$$

$$9 = 8x^2 - x$$

$$0 = 8x^2 - x - 9$$

$$0 = (8x-9)(x+1)$$

$$\text{either } 8x-9=0 \quad \text{OR} \quad x+1=0$$

$$8x - \cancel{x} + \cancel{x} = 0 + 9$$

$$8x = 9$$

$$\frac{8x}{8} = \frac{9}{8}$$

$$x = \frac{9}{8}$$

$$\text{OR } x+1-1 = 0-1$$

$$\text{OR } x = -1$$

ck

$$\text{ck } \log_9(x) + \log_9(8x-1) = 1$$

$$\log_9(-1) + \log_9(8(-1)-1) = 1$$

$$\log_9(-1) + \log_9(-8-1) = 1$$

$$\log_9(-1) + \log_9(-9) = 1$$

BAD BAD

$$\log_9\left(\frac{9}{8}\right) + \log_9\left(8\left(\frac{9}{8}\right)-1\right) = 1$$

$$\log_9\left(\frac{9}{8}\right) + \log_9(9-1) = 1$$

$$\log_9\left(\frac{9}{8}\right) + \log_9(8) = 1$$

Good

Good

$$\left\{ \frac{9}{8} \right\}$$

$$\textcircled{29} \log_4(x+13) - \log_4(x-2) = 2$$

$$\log_4\left(\frac{x+13}{x-2}\right) = 2$$

$$4^2 = \frac{x+13}{x-2}$$

$$16 = \frac{x+13}{x-2}$$

$$\frac{16}{1} = \frac{x+13}{x-2}$$

$$16(x-2) = 1(x+13) \text{ (cross mult)}$$

$$16x - 32 = 1x + 13$$

$$16x - 32 + 32 = 1x + 13 + 32$$

$$16x = 1x + 45$$

$$16x - 1x = 1x + 45 - 1x$$

$$15x = 45$$

$$\frac{15x}{15} = \frac{45}{15}$$

$$x = 3$$

ck

$$\log_4(x+13) - \log_4(x-2) = 2$$

$$\log_4(3+13) - \log_4(3-2) = 2$$

$$\log_4(16) - \log_4(1) = 2$$

Good

Good

30

Formula

$$\log_4(A) - \log_4(B) =$$

$$\log_4\left(\frac{A}{B}\right) =$$

{ 3 }

30.

$$x + y + 7z = 12$$

$$x + y + 5z = 10$$

$$x - 8y - 2z = -24$$

use graphing calculator

Solve

31.

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

2ND, Matrix, Math, rref (  $\begin{matrix} \text{2ND} \\ \text{matrix} \\ [A] \end{matrix}$  )

$$\text{rref}([A]) =$$

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

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

31) Write the first three terms  $(X+2)^9$

$$(X+2)^9$$

$$\sum_{r=0}^9 \binom{9}{r} (X)^{9-r} (2)^r =$$

$$(1)(X^9)(2)^0 + (9)(X^8)(2)^1 + (36)(X^7)(2)^2 =$$

$$(1)(X^9)(1) + (9)(X^8)(2) + (36)(X^7)(4) =$$

$$X^9 + 18X^8 + 144X^7 =$$

use

$$9, \text{Math}, \text{PRB}, \text{NCR}, \text{enter}, 0, \text{enter} = 1$$

$$9, \text{Math}, \text{PRB}, \text{NCR}, \text{enter}, 1, \text{enter} = 3$$

$$9, \text{Math}, \text{PRB}, \text{NCR}, \text{enter}, 2, \text{enter} = 3$$

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