06-25-19
06-26-19

Student: ______________	Instructor: Alfredo Alvarez	Assignment: M1314FIESTACOREFINALU025c
Date: ______________	Course: Math 1314 Alvarez	

06-27-19
06-28-19

1. Use factoring to solve the quadratic equation. Check by substitution or by using a graphing utility and identifying x-intercepts.

$$x^2 - 4x - 45 = 0$$

The solution set is { }.
(Use a comma to separate answers as needed. Type repeated roots only once.)

2. Solve the equation by factoring.

$$x^2 = 2x + 24$$

The solution set is { }.
(Use a comma to separate answers as needed.)

3. Solve the equation by factoring.

$$8x^2 + 10x - 7 = 0$$

The solution set is { }.
(Use a comma to separate answers as needed.)

4. Solve the equation by the method of your choice.

$$3x^2 + 2x = 5$$

The solution set is { }.
(Type an exact answer, using radicals as needed. Use a comma to separate answers as needed.)

5. Solve the given radical equation. Check all proposed solutions.

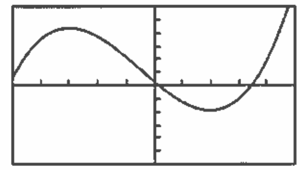
$$\sqrt{3x + 28} = x + 6$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The solution set is { }.
  (Use a comma to separate answers as needed.)
- B. There is no solution.

6.
The graph and equation of the function f are given.
a. Use the graph to find any values at which f has a relative maximum, and use the equation to calculate the relative maximum for each value.
b. Use the graph to find any values at which f has a relative minimum, and use the equation to calculate the relative minimum for each value.

$f(x) = 2x^3 + 3x^2 - 36x + 6$



$[-5,5,1]$ by $[-120,120,20]$

a. Select the correct choice below and, if necessary, fill in the answer boxes to complete your choice.

○ **A.** The function f has (a) relative maxima(maximum) at ______ and the relative maxima(maximum) are(is) ______.
(Use a comma to separate answers as needed.)

○ **B.** The function f has no relative maxima.

b. Select the correct choice below and, if necessary, fill in the answer boxes to complete your choice.

○ **A.** The function f has (a) relative minima(minimum) at ______ and the relative minima(minimum) are(is) ______.
(Use a comma to separate answers as needed.)

○ **B.** The function f has no relative minima.

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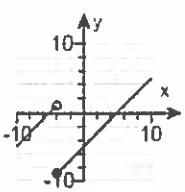
7. The domain of the piecewise function is $(-\infty,\infty)$.
a. Graph the function.
b. Use your graph to determine the function's range.

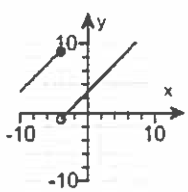
$$f(x) = \begin{cases} x+5 & \text{if } x < -4 \\ x-5 & \text{if } x \geq -4 \end{cases}$$

a. Choose the correct graph below.

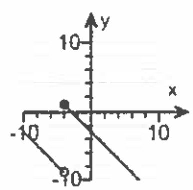
○ **A.**



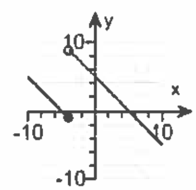
○ **B.**



○ **C.**



○ **D.**



b. The range of f(x) is ______. (Type your answer in interval notation.)

8.
Find the difference quotient of f; that is, find $\frac{f(x+h)-f(x)}{h}$, $h \neq 0$, for the following function. Be sure to simplify.

$f(x) = x^2 - 7x + 9$

$\frac{f(x+h)-f(x)}{h} =$ ______ (Simplify your answer.)

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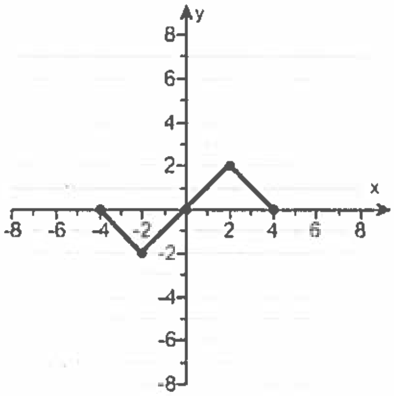
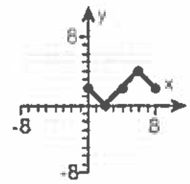
9. Use the graph of y = f(x) to graph the function $g(x) = f(x + 4) - 2$.

y = f(x)

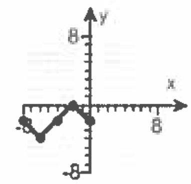


Choose the correct graph of g below.

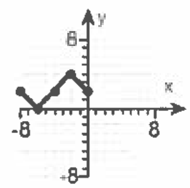
○ **A.**



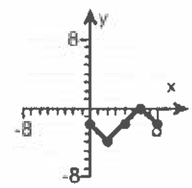
○ **B.**



○ **C.**



○ **D.**



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10. Find the domain of the function.

$f(x) = \sqrt{25 - 5x}$

What is the domain of f?

[ ] (Type your answer in interval notation.)

11. First find f + g, f − g, fg and $\frac{f}{g}$. Then determine the domain for each function.

$f(x) = 5x - 4,\ g(x) = x - 6$

$(f+g)(x) =$ ______ (Simplify your answer.)

What is the domain of f + g?

- ○ $\left(-\infty, \frac{5}{3}\right) \cup \left(\frac{5}{3}, \infty\right)$
- ○ $\left(\frac{5}{3}, \infty\right)$
- ○ $(-\infty, \infty)$
- ○ $[0, \infty)$

$(f-g)(x) =$ ______ (Simplify your answer.)

What is the domain of f − g?

- ○ $\left(-\frac{1}{2}, \infty\right)$
- ○ $\left(-\infty, -\frac{1}{2}\right) \cup \left(-\frac{1}{2}, \infty\right)$
- ○ $[0, \infty)$
- ○ $(-\infty, \infty)$

$(fg)(x) =$ ______

What is the domain of fg?

- ○ $(-\infty, 6) \cup (6, \infty)$
- ○ $[0, \infty)$
- ○ $(-\infty, \infty)$
- ○ $\left(-\infty, \frac{4}{5}\right) \cup \left(\frac{4}{5}, \infty\right)$

$\left(\frac{f}{g}\right)(x) =$ ______

What is the domain of $\frac{f}{g}$?

- ○ $(6, \infty)$
- ○ $[0, \infty)$
- ○ $(-\infty, 6) \cup (6, \infty)$
- ○ $(-\infty, \infty)$

12. For $f(x) = x + 2$ and $g(x) = 4x + 1$, find the following functions.

a. $(f \circ g)(x)$; **b.** $(g \circ f)(x)$; **c.** $(f \circ g)(2)$; **d.** $(g \circ f)(2)$

a. $(f \circ g)(x) =$ ______ (Simplify your answer.)

b. $(g \circ f)(x) =$ ______ (Simplify your answer.)

c. $(f \circ g)(2) =$ ______

d. $(g \circ f)(2) =$ ______

---

13. Find the midpoint of the line segment with the given endpoints.

(6,2) and (4,10)

The midpoint of the segment is ______.
(Type an ordered pair.)

---

14. Use the vertex and intercepts to sketch the graph of the quadratic function. Give the equation of the parabola's axis of symmetry. Use the graph to determine the domain and range of the function.

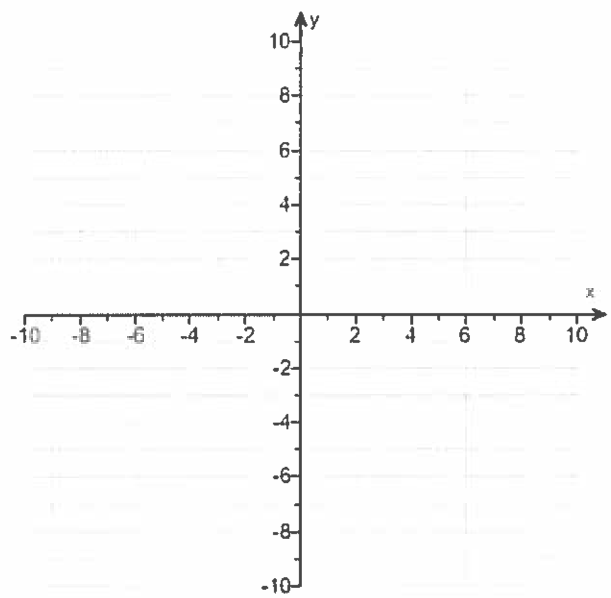
$f(x) = 2x - x^2 + 8$

Use the graphing tool to graph the equation. Use the vertex and one of the intercepts to draw the graph.

The axis of symmetry is ______.
(Type an equation.)

The domain of the function is ______.
(Type your answer in interval notation.)

The range of the function is ______.
(Type your answer in interval notation.)



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15. Consider the function $f(x) = -2x^2 + 20x - 9$.

a. Determine, without graphing, whether the function has a minimum value or a maximum value.
b. Find the minimum or maximum value and determine where it occurs.
c. Identify the function's domain and its range.

a. The function has a (1) ______ value.

b. The minimum/maximum value is ______. It occurs at x = ______.

c. The domain of f is ______. (Type your answer in interval notation.)

The range of f is ______. (Type your answer in interval notation.)

(1) ○ maximum
○ minimum

---

16. The following equation is given.

$$x^3 - 2x^2 - 25x + 50 = 0$$

a. List all rational roots that are possible according to the Rational Zero Theorem.

(Use a comma to separate answers as needed.)

b. Use synthetic division to test several possible rational roots in order to identify one actual root.

One rational root of the given equation is ____.
(Simplify your answer.)

c. Use the root from part (b.) and solve the equation.

The solution set of $x^3 - 2x^2 - 25x + 50 = 0$ is $\{\ \}$.
(Simplify your answer. Type an exact answer, using radicals as needed. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)

---

17. Find the vertical asymptotes, if any, and the values of x corresponding to holes, if any, of the graph of the rational function.

$$h(x) = \frac{x+3}{x(x+7)}$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice. (Type an equation. Use a comma to separate answers as needed.)

- **A.** The vertical asymptote(s) is(are) ____. There are no holes.
- **B.** There are no vertical asymptotes but there is(are) hole(s) corresponding to ____.
- **C.** The vertical asymptote(s) is(are) ____ and hole(s) corresponding to ____.
- **D.** There are no discontinuities.

---

18. Find the horizontal asymptote, if any, of the graph of the rational function.

$$g(x) = \frac{18x^2}{9x^2 + 2}$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- **A.** The horizontal asymptote is ____. (Type an equation.)
- **B.** There is no horizontal asymptote.

---

19. Solve the following exponential equation by expressing each side as a power of the same base and then equating exponents.

$$27^{x+9} = 243^{x-1}$$

The solution set is $\{\ \}$.

---

20. Solve the logarithmic equation. Be sure to reject any value of x that is not in the domain of the original logarithmic expressions. Give the exact answer.

$$\log_5(x+16) - \log_5(x-8) = 2$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The solution set is { }.
  (Simplify your answer. Use a comma to separate answers as needed.)
- B. There is no solution.

21. Solve the logarithmic equation. Be sure to reject any value of x that is not in the domain of the original logarithmic expressions. Give the exact answer.

$$\log x + \log(x+4) = \log 32$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The solution set is { }.
  (Simplify your answer. Use a comma to separate answers as needed.)
- B. There is no solution.

22. Complete the table for a savings account subject to continuous compounding.

$$(A = Pe^{rt})$$

Amount Invested	Annual Interest Rate	Accumulated Amount	Time t in years
$5000	5%	$10,000	?

Let A represent the accumulated amount, P the amount invested, r the annual interest rate, and t the time. Find the time, t.

$t \approx$ ____ years
(Round to one decimal place as needed.)

23. Solve the given system of equations.

$$\begin{aligned} x + y + 6z &= -20 \\ x + y + 3z &= -11 \\ x + 8y + 9z &= -36 \end{aligned}$$

Select the correct choice below and fill in any answer boxes within your choice.

- A. There is one solution. The solution set is {(____ , ____ , ____)}. (Simplify your answers.)
- B. There are infinitely many solutions.
- C. There is no solution.

24. Write the first four terms of the sequence whose general term is given.

$$a_n = \frac{2n}{n+9}$$

$a_1 =$ ______ (Simplify your answer.)

$a_2 =$ ______ (Simplify your answer.)

$a_3 =$ ______ (Simplify your answer.)

$a_4 =$ ______ (Simplify your answer.)

25.

Find the indicated sum. $\sum_{i=1}^{4} i(i+1)$

$\sum_{i=1}^{4} i(i+1) =$ ______ (Simplify your answer.)

1. $-5,9$

2. $6,-4$

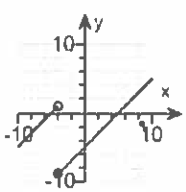
3. $\frac{1}{2},-\frac{7}{4}$

4. $1,-\frac{5}{3}$

5. A. The solution set is $\{-1\}$.(Use a comma to separate answers as needed.)

6. A.
The function f has (a) relative maxima(maximum) at -3 and the relative maxima(maximum) are(is) 87.
(Use a comma to separate answers as needed.)

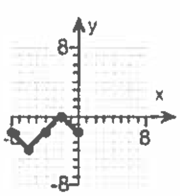
A.
The function f has (a) relative minima(minimum) at 2 and the relative minima(minimum) are(is) -38.
(Use a comma to separate answers as needed.)

7.


A.

$(-\infty,\infty)$

8. $2x+h-7$

9.


B.

10. $(-\infty,5]$

11. $6x - 10$

$(-\infty,\infty)$

$4x + 2$

$(-\infty,\infty)$

$5x^2 - 34x + 24$

$(-\infty,\infty)$

$\dfrac{5x-4}{x-6}$

$(-\infty,6)\cup(6,\infty)$

---

12. $4x + 3$

$4x + 9$

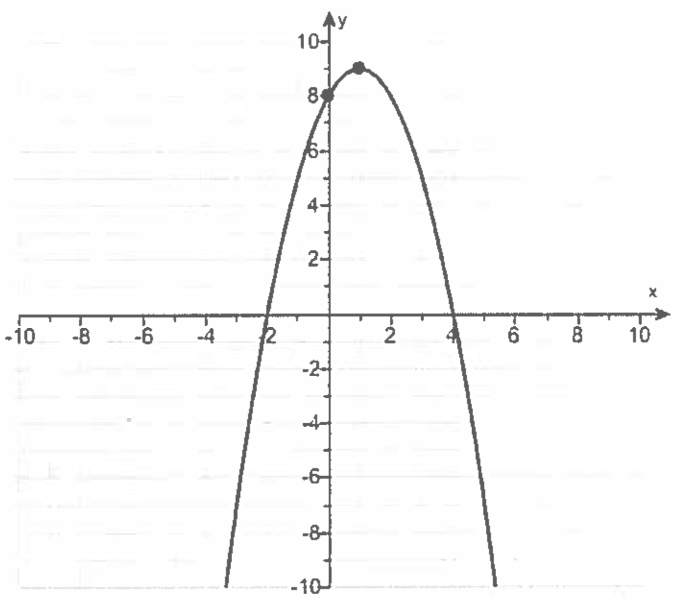
11

17

---

13. (5,6)

14.



$x = 1$

$(-\infty,\infty)$

$(-\infty,9]$

---

15. (1) maximum

41

5

$(-\infty,\infty)$

$(-\infty,41]$

---

16. $1,-1,5,-5,50,-50,2,-2,10,-10,25,-25$

2

$2,5,-5$

---

17. A. The vertical asymptote(s) is(are) $\boxed{x=-7,x=0}$. There are no holes.

---

18. A. The horizontal asymptote is $\boxed{y=2}$. (Type an equation.)

---

19. 16

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20. A. The solution set is $\{\boxed{9}\}$.(Simplify your answer. Use a comma to separate answers as needed.)

---

21. A. The solution set is $\{\boxed{4}\}$.(Simplify your answer. Use a comma to separate answers as needed.)

---

22. 13.9

---

23. A.
There is one solution. The solution set is $\{(\boxed{-1},\boxed{-1},\boxed{-3})\}$. (Simplify your answers.)

---

24. $\frac{1}{5}$

$\frac{4}{11}$

$\frac{1}{2}$

$\frac{8}{13}$

---

25. 40

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Possib4

45, 1
15, 3
9, 5

1. $x^2 - 4x - 45 = 0$

$(x+5)(x-9) = 0$

Let $x+5=0$ OR $x-9=0$

$x+5-5=0-5$ OR $x-9+9=0+9$

$x=-5$ OR $x=9$

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

Possible
$24 \cdot 1$
$12 \cdot 2$
$6 \cdot 4$
$3 \cdot 8$

$x^2 - 2x - 24 = 0$ rewrite

$(x + 4)(x - 6) = 0$

set $x + 4 = 0$ or $x - 6 = 0$

$x + 4 - 4 = 0 - 4$ OR $x - 6 + 6 = 0 + 6$

$x = -4$ or $x = 6$

Possible

8·1 2·4 7·1

3) $8x^2+10x-7=0$

$(2x-1)(4x+7)=0$

set $2x-1=0$ or $4x+7=0$

$2x-1+1=0+1$ or $4x+\cancel{7}-\cancel{7}=0-7$

$2x=1$ or $4x=-7$

$\frac{2x}{2}=\frac{1}{2}$ or $\frac{\cancel{4}x}{\cancel{4}}=\frac{-7}{4}$

$x=1/2$ or $x=\frac{-7}{4}$

(4) $3x^2 + 2x = 5$

Use Quadratic formula

$3x^2 + 2x - 5 = 0$

$a = 3, \quad b = 2, \quad c = -5$

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

$x = \frac{-(2) \pm \sqrt{(2)^2 - 4(3)(-5)}}{2(3)}$

$x = \frac{-2 \pm \sqrt{4 + 60}}{6}$

$x = \frac{-2 \pm \sqrt{64}}{6}$

$x = \frac{-2 \pm 8}{6}$

$x = \frac{-2 + 8}{6}$ or $x = \frac{-2 - 8}{6}$

$x = \frac{6}{6}$ or $x = \frac{-10}{6}$

$x = \frac{\cancel{2}(-5)}{\cancel{2}(3)}$

$x = 1$ or $x = -\frac{5}{3}$

5.

$\sqrt{3x+28} = x+6$

$\left(\sqrt{3x+28}\right)^2 = (x+6)^2$

$3x+28 = (x+6)(x+6)$

$3x+28 = x^2+6x+6x+36$

$3x+28 = x^2+12x+36$

$0 = x^2+12x+36-3x-28$

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

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

set $x+1=0$ or $x+8=0$

$x+1-1=0-1$ or $x+8-8=0-8$

$x=-1$ or $\cancel{x=-8}$

Check

$\sqrt{3x+28} = x+6$

$\sqrt{3(-1)+28} = (-1)+6$

$\sqrt{-3+28} = -1+6$

$\sqrt{25} = 5$

$5 = 5$

Good

$\sqrt{3(-8)+28} = -8+6$

$\sqrt{-24+28} = -2$

$\sqrt{4} = -2$

$2 \neq -2$

BAD answer

$\boxed{x=-1}$

⑥ find the relative max and min.

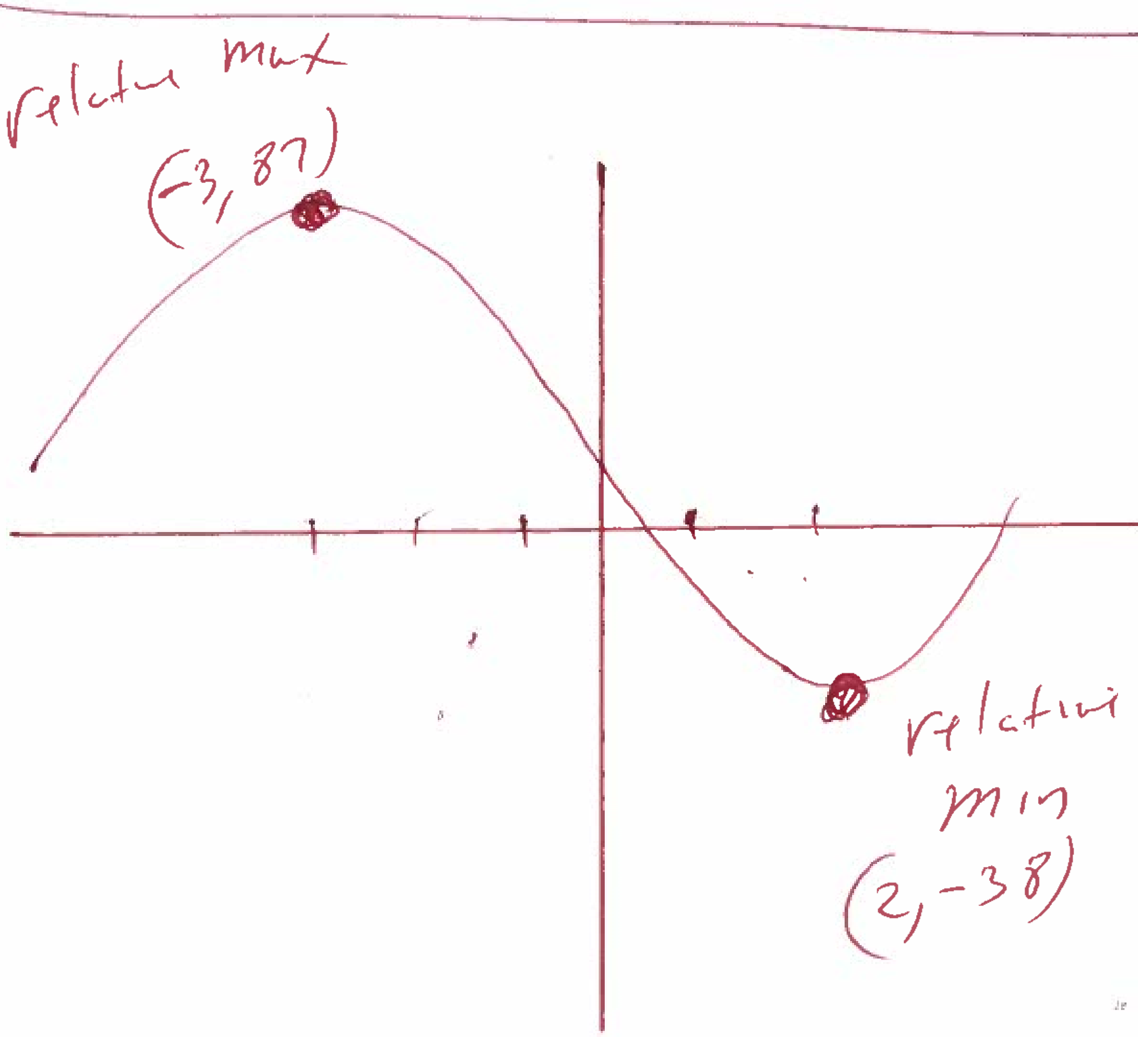
$f(x) = 2x^3 + 3x^2 - 36x + 6$

windows

x-min = -5
x-max = 5
y-min = -120
y-max = 120

use graphing calculator

$y_1 = 2x^3 + 3x^2 - 36x + 6$



7. graph

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

window

x-min = -12

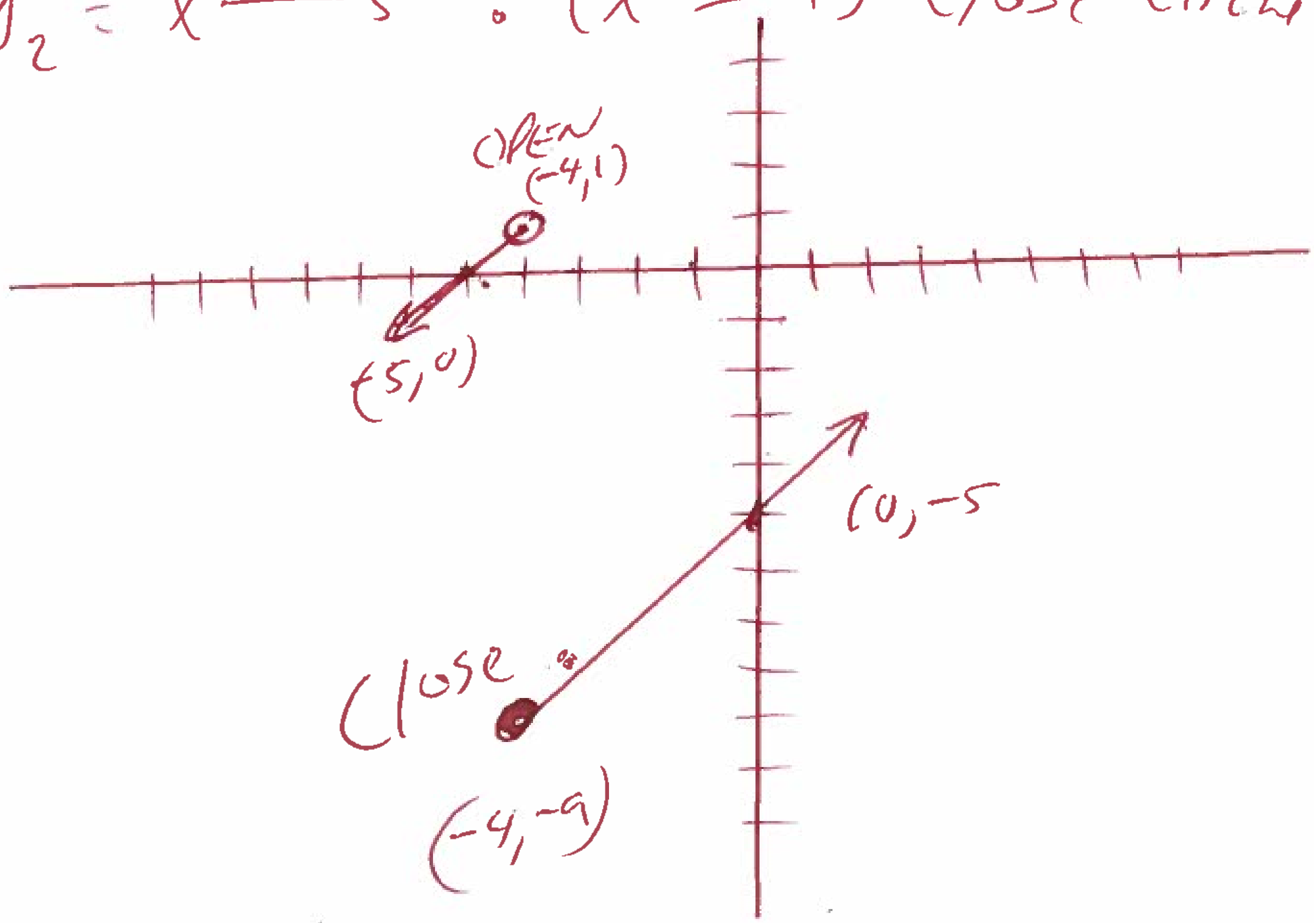
x-max = 12

y-min = -10

y-max = 10

$y_1 = x+5 \div (x < -4)$ open circle

$y_2 = x - 5 \div (x \geq -4)$ close circle



8. $f(x) = x^2 - 7x + 9$

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

$$\frac{\left((x+h)^2 - 7(x+h) + 9\right) - \left(x^2 - 7x + 9\right)}{h} =$$

$$\frac{(x+h)(x+h) - 7x - 7h + 9 - x^2 + 7x - 9}{h} =$$

$$\frac{x^2 + xh + xh + h^2 - 7x - 7h + 9 - x^2 + 7x - 9}{h} =$$

$$\frac{\cancel{x^2} + 2xh + h^2 \cancel{- 7x} - 7h \cancel{+ 9} \cancel{- x^2} \cancel{+ 7x} \cancel{- 9}}{h} =$$

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

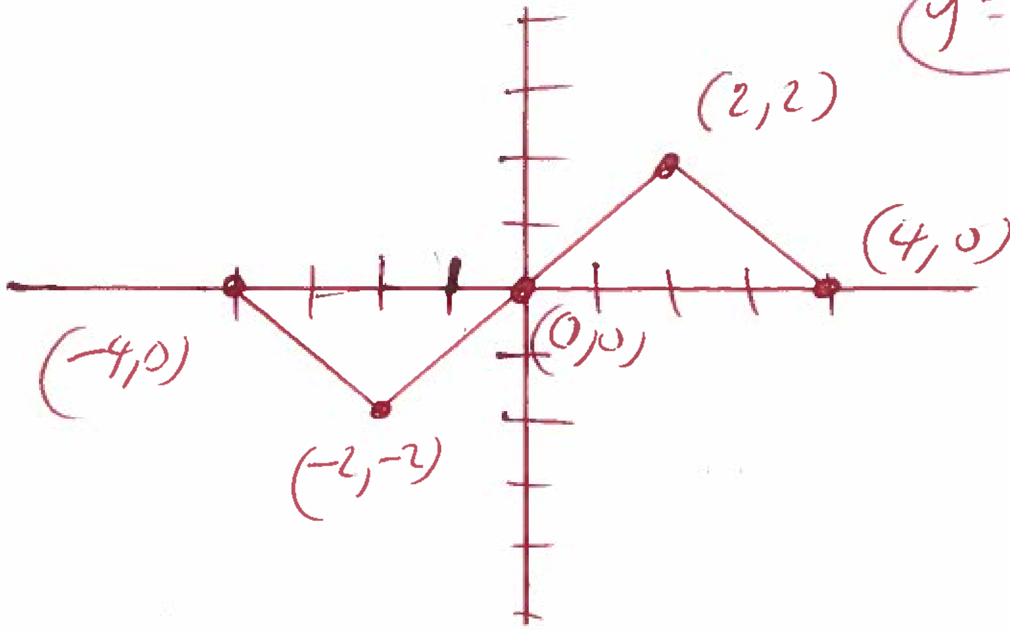
$$\frac{2xh}{h} + \frac{h^2}{h} - \frac{7h}{h} =$$

$$2x + h - 7 =$$

9.

$y = f(x)$

OLD

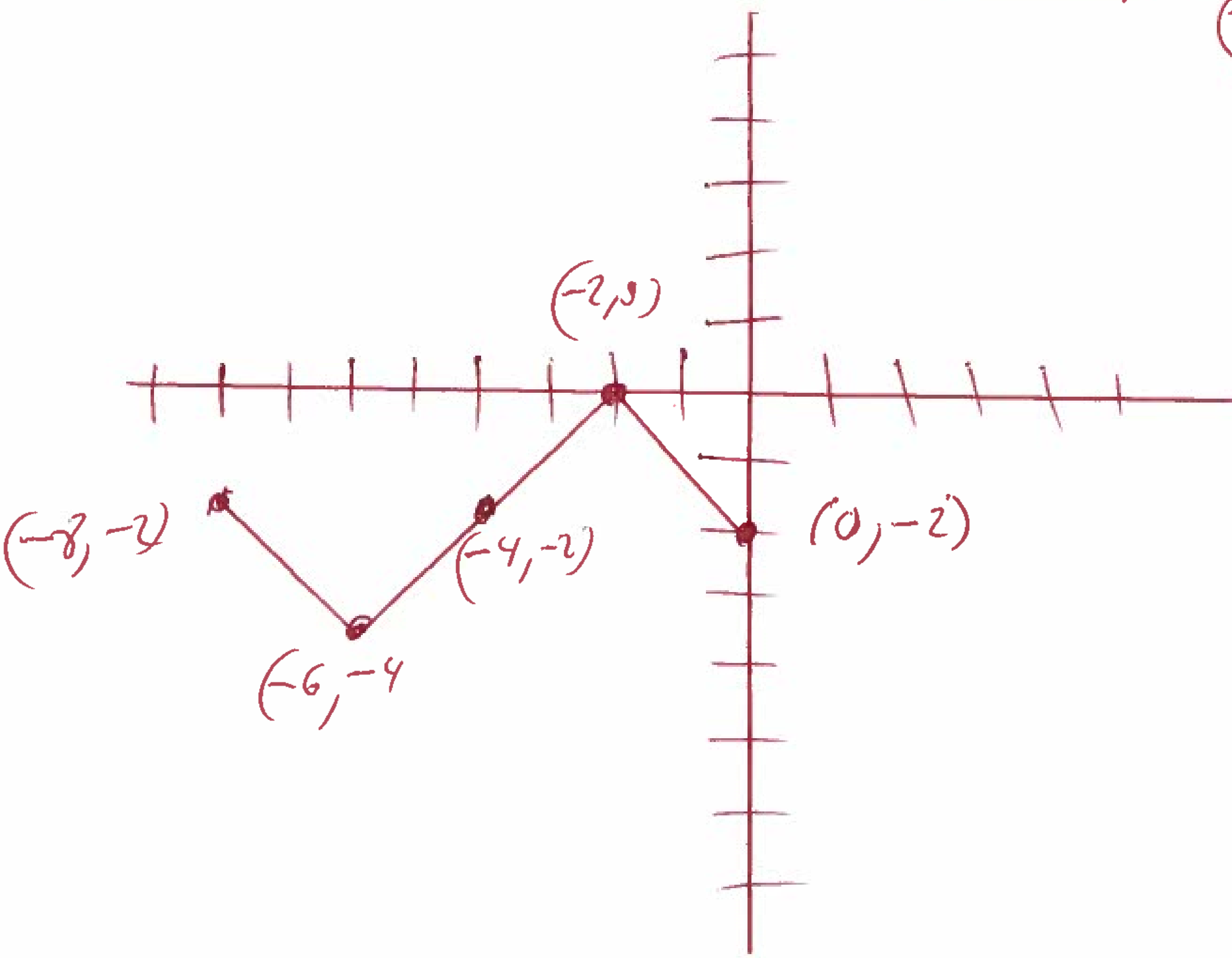


new

$g(x) = f(x+4) - 2$

shift left −4

shift down −2



(10.) Find the domain

$f(x) = \sqrt{25-5x}$

formula domain

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

set $Ax+B \geq 0$

set $25-5x \geq 0$

$\cancel{25} - 5x - \cancel{25} \geq 0 - 25$

$-5x \geq -25$

$\frac{-5x}{-5} \leq \frac{-25}{-5}$ divide by a negative turn alligator around

$x \leq 5$

$(-\infty, 5]$

(11) $f(x) = 5x - 4$ and $g(x) = x - 6$

$(f+g)(x) =$

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

$(5x - 4) + (x - 6) =$

$5x - 4 + x - 6 =$ ✓

$6x - 10 =$ domain $(-\infty, \infty)$

$(f-g)(x) =$

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

$(5x - 4) - (x - 6) =$

$5x - 4 - x + 6 =$ ✓

$4x + 2 =$ domain $(-\infty, \infty)$

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

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

$(5x - 4)(x - 6) =$

$5x^2 - 30x - 4x + 24 =$ ✓

$5x^2 - 34x + 24 =$ domain $(-\infty, \infty)$

$\left(\frac{f}{g}\right)(x) =$

$\frac{f(x)}{g(x)} =$

$\frac{5x - 4}{x - 6} =$ ✓ range $(-\infty, 6) \cup (6, \infty)$

12. $f(x) = x+2$ and $g(x) = 4x+1$

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

$f(g(x)) =$

$f(4x+1) =$

$(4x+1)+2 =$

$4x+1+2 =$

$4x+3 =$

$(f \circ g)(x) = 4x+3$

$(f \circ g)(2) = 4(2)+3$

$(f \circ g)(2) = 8+3$

$(f \circ g)(2) = 11$

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

$g(f(x)) =$

$g(x+2) =$

$4(x+2)+1 =$

$4x+8+1 =$

$4x+9 =$

$(g \circ f)(x) = 4x+9$

$(g \circ f)(2) = 4(2)+9$

$(g \circ f)(2) = 8+9$

$(g \circ f)(2) = 17$

13. find the midpoint

$(6, 2)$ and $(4, 10)$

$x_1 \quad y_1 \qquad x_2 \quad y_2$

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

$$\text{midpoint} = \left(\frac{(6)+(4)}{2}, \frac{(2)+(10)}{2}\right)$$

$$\text{midpoint} = \left(\frac{6+4}{2}, \frac{2+10}{2}\right)$$

$$\text{midpoint} = \left(\frac{10}{2}, \frac{12}{2}\right)$$

$$\text{midpoint} = (5, 6)$$

14. graph

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

window

x-min = -12

x-max = 12

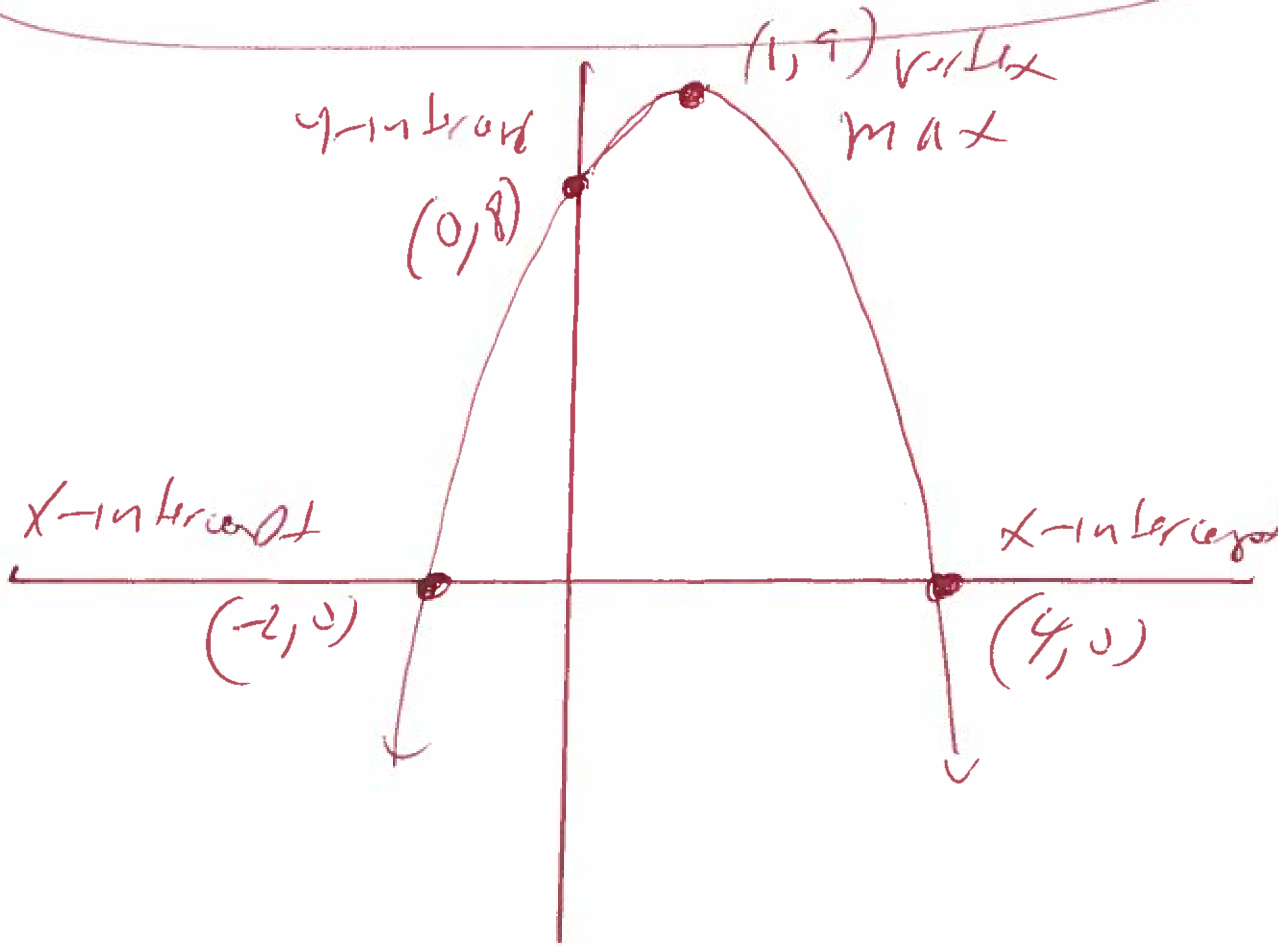
y-min = -10

y-max = 10

Use a graphing Calculator

BIG

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



(15.) $f(x) = -2x^2 + 20x - 9$

$a = -2, \quad b = 20, \quad c = -9$

Graph opens down

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

$$= \left(-\frac{(20)}{2(-2)},\ f\left(-\frac{(20)}{2(-2)}\right)\right)$$

$$= \left(\frac{-20}{-4},\ f\left(\frac{-20}{-4}\right)\right)$$

$$= (5,\ f(5))$$

$$= (5,\ -2(5)^2 + 20(5) - 9)$$

$$= (5,\ -2(5)(5) + 20(5) - 9)$$

$$= (5,\ -50 + 100 - 9)$$

$$= (5,\ 41)$$

Max

(16) $1x^3-2x^2-25x+50=0$

$\frac{\text{Last}}{\text{first}}$

Possibli rational zeros

$\pm 50, \pm 25, \pm 10, \pm 5, \pm 2, \pm 1$

$\frac{\pm 50}{\pm 1}$

$\frac{\pm 50, \pm 25, \pm 10, \pm 5, \pm 2, \pm 1}{\pm 1} =$

use synthetic division

try $x=5$

$$\begin{array}{r|rrrr} 5 & 1 & -2 & -25 & 50 \\ & & 5 & 15 & -50 \\ \hline & 1 & 3 & -10 & 0 \end{array}$$

0 rem

$x^2+3x-10=0$

$(x-2)(x+5)=0$

$x-2=0$ or $x+5=0$

$x-2+2=0+2$ OR $x+5-5=0-5$

$x=2$ or $x=-5$

answer

$\boxed{5, 2, -5}$

(17) find the vertical asymptotes

$$h(x) = \frac{x+3}{x(x+7)}$$

set $x(x+7) = 0$

$x = 0$ OR $x + 7 = 0$

$x + 7 - 7 = 0 - 7$

$x = -7$

vertical asymptotes

$x = 0$ OR $x = -7$

(18) Find the horizontal asymptote

$$g(x) = \frac{18x^2}{9x^2+2}$$

formula

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

$$\lim_{x\to\infty} \frac{18x^2}{9x^2+2} =$$

$$\lim_{x\to\infty} \left(\frac{18x^2}{9x^2+2}\right) \frac{\frac{1}{x^2}}{\frac{1}{x^2}} =$$

$$\lim_{x\to\infty} \frac{\frac{18x^2}{x^2}}{\frac{9x^2}{x^2} + \frac{2}{x^2}}$$

$$\lim_{x\to\infty} \frac{18}{9 + \frac{2}{x^2}}$$

$$\frac{18}{9+0} =$$

$$\frac{18}{9} =$$

$$2 =$$

horizontal asymptote

$$y = 2$$

(19) $27^{x+9} = 243^{x-1}$

$(3^3)^{x+9} = (3^5)^{x-1}$

$3^{3x+27} = 3^{5x-5}$

$3x + 27 = 5x - 5$

$3x + \cancel{27} - \cancel{27} = 5x - 5 - 27$

$3x = 5x - 32$

$3x - 5x = 5x - 32 - 5x$

$-2x = -32$

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

$x = 16$

(20) $\log_5(x+16) - \log_5(x-8) = 2$

$\log_5\left(\frac{x+16}{x-8}\right) = 2$

$5^2 = \frac{x+16}{x-8}$ rewrite

$\frac{25}{1} = \frac{x+16}{x-8}$

$25(x-8) = 1(x+16)$

$25x - 200 = 1x + 16$

$25x - \cancel{200} + \cancel{200} = 1x + 16 + 200$

$25x = 1x + 216$

$25x - 1x = \cancel{1x} + 216 - \cancel{1x}$

$24x = 216$

$\frac{24x}{24} = \frac{216}{24}$

$x = 9$

Check

answer

$\boxed{x = 9}$

$\log_5(9+16) - \log_5(9-8) = 2$

$\log_5(25) - \log_5(1) = 2$

Good Good

(21)

$$\log(x)+\log(x+4)=\log(32)$$

Possible

32·1

16·2

4·8

$$\log(x)(x+4)=\log(32)$$

$$x(x+4)=32$$

$$x^2+4x=32$$

$$x^2+4x-32=0$$

$$(x-4)(x+8)=0$$

Set $x-4=0$ OR $x+8=0$

$x-4+4=0+4$ OR $x+8-8=0-8$

$x=4$ OR $\cancel{x=-8}$

Check

$$\log(x)+\log(x+4)=\log(32)$$

$$\log(4)+\log(4+4)=\log(32)$$

$$\log(4)+\log(8)=\log(32)$$

Good Good Good

$$\log(-8)+\log(-8+4)=\log(32)$$

$$\log(-8)+\log(-4)=\log(32)$$

BAD BAD

---

answer

$\boxed{x=4}$ only

---

(22) $A = Pe^{rt}$

$A = \$10{,}000$

$P = \$5{,}000$

$r = 5\% = .05$

$t = ?$

$10{,}000 = 5{,}000 e^{.05t}$

$\frac{10{,}000}{5000} = \frac{\cancel{5000} e^{.05t}}{\cancel{5000}}$

$2 = e^{.05t}$

$\ln(2) = \ln(e^{.05t})$

$\ln(2) = .05t \ln(e)$

$\ln(2) = .05t\,(1)$

$\ln(2) = .05t$

$\frac{\ln(2)}{.05} = \frac{\cancel{.05}t}{\cancel{.05}}$

$13.86294361 = t$

OR

$13.9 = t$

Round

formula

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

$\ln(e) = 1 =$

(23.)

Solve System

$$x+y+6z=-20$$
$$x+y+3z=-11$$
$$x+8y+9z=-36$$

2ND, Matrix, Edit, [A], 3X4, enter

$$[A]=\begin{bmatrix} 1 & 1 & 6 & -20 \\ 1 & 1 & 3 & -11 \\ 1 & 8 & 9 & -36 \end{bmatrix}$$

2ND, Matrix, Math, $\downarrow$, rref( ),

2ND Matrix

rref ([A]) =

$$\begin{array}{cc} \begin{bmatrix} 1 & 0 & 0 & -1 \\ 0 & 1 & 0 & -1 \\ 0 & 0 & 1 & -3 \end{bmatrix} & \begin{array}{c} x \\ y \\ z \end{array} \end{array}$$

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

(24) write the first four terms of the sequence

$$a_n = \frac{2n}{n+9}$$

$$a_1 = \frac{2(1)}{1+9} = \frac{2}{10} = \frac{\cancel{2}(1)}{\cancel{2}(5)} = \frac{1}{5}$$

$$a_2 = \frac{2(2)}{2+9} = \frac{4}{11}$$

$$a_3 = \frac{2(3)}{3+9} = \frac{6}{12} = \frac{\cancel{6}(1)}{\cancel{6}(2)} = \frac{1}{2}$$

$$a_4 = \frac{2(4)}{4+9} = \frac{8}{13}$$

28.

$$\sum_{i=1}^{4} i(i+1)$$

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

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

$2 + 6 + 12 + 20 =$

$40 =$

Or use graphing calculator

Math, ↓, Summation $\Sigma(\ )$

$$\sum_{\square=\square}^{\square} \square$$