Problem 1 (2 pts). Consider the function $f(x) = \frac{1}{3x+3}$. What is the domain of f?

(a) The set of all real numbers x such that $x = -1$

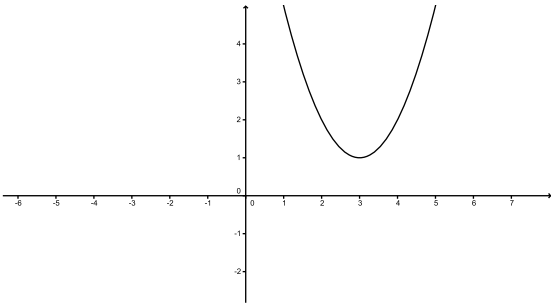
(b) The set of all real numbers x such that $-1 < x$

(c) The set of all real numbers x such that $x \neq -1$

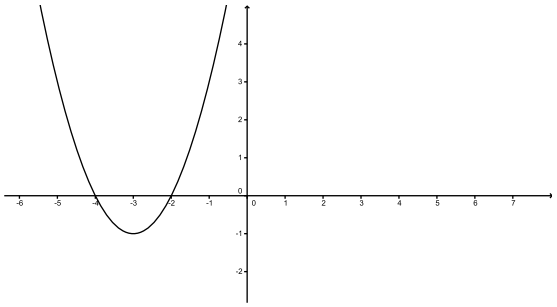
(d) The set of all real numbers x such that $-1 \leq x$

(e) All real numbers x

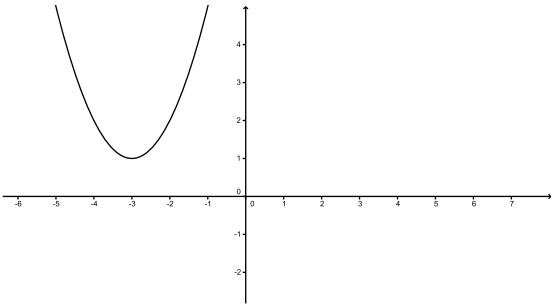
Problem 2 (2 pts). Select the graph that represents the function $y = (x-3)^2 - 1$



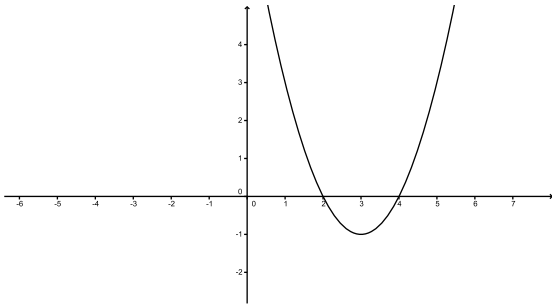
(a)



(b)



(c)



(d)

Problem 3 (2 pts). Which of the following inequalities does not have a solution:

(a) $|x+2| < -3$

(b) $|x+2| > -3$

(c) $|x+2| > 3$

(d) $|x+2| < 3$

(e) None of the above

Problem 4 (2 pts). Which of the statements below are correct? Circle all that are.

(a) $1^0 = 1$

(b) $1^{10} = 1$

(c) $10^1 = 10$

(d) $10^0 = 1$

(e) $0^0 = 1$

Problem 5 (2 pts). Select the expression that is equivalent to:

$$\log_3 9 + \log_5 5 - \log_6 1$$

(a) 0

(b) 1

(c) -2

(d) 3

(e) None of the above (not possible to evaluate without calculator)

Problem 6 (2 pts). Select the expression that is equivalent to:

$$2 - 3^2(1 - 3)$$

(a) -16

(b) 20

(c) -4

(d) -3

(e) None of the above (not possible to evaluate without calculator)

Average: 71.21

Problem 7 (True/false). Each problem is worth 1 point. Circle your choice:

T F	$\frac{1}{0} = 1$	**T F**	$a^2 + b^2 = (a+b)^2$
T F	$-2^3 = 8$	**T F**	$\log_2(-1) = \frac{1}{2}$
T F	Decreasing the price by 10%, then increasing it by 10% yields the original price	**T F**	$\sqrt{x^2+y^2} = x + y$
T F	$\frac{0}{0} = 1$	**T F**	$2^{-1} = -2$

Average: 76.73

Problem 8 (Linear Equations - 12 pts). Solve the following equations

(a) $-5x+3=-4+2x$ $\qquad x=$ ____

(b) $-5x+3=-4-2(x-1)$ $\qquad x=$

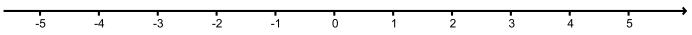
(c) $\dfrac{3}{x}+2=7$ $\qquad x=$ _____

Average: 86.12

Problem 9 (Inequality - 4pts). Solve the following inequality and graph the solution

$$1-3x\leq -5$$

Graph:



Average: 86.26

Problem 10 (Quadratic Equations - 12pts). Find all solutions of the equations

(a) $x^2-2x-8=0$ $\qquad x=$ _____

(b) $x^2-x+3=5$ $\qquad x=$ _____

(c) $2x^2-3x-1=0$ $\qquad x=$ _____

Average: 74.98

Problem 11 (Quadratic functions - 4pts). Jason jumped off of a cliff into the ocean in Acapulco while vacationing with some friends. His height as a function of time could be modeled by the function $h(t)=-16t^2+16t+480$, where t is the time in seconds and h is the height from the water level in feet. After how many seconds does Jason hit the water?

time in the air _____

Average: 61.57

ALL PROBLEMS ON THIS PAGE RELATE TO THIS FUNCTION

$$\boxed{f(x)=\tfrac{x^2+1}{x+2}}$$

Problem 12 (Evaluate at a point - 2pts). Find $f(-1)$.

$f(-1)=$ _____

Problem 13 (Evaluate at an expression - 2pts). Find $f(a-1)$.

$f(a-1)=$ _____

Problem 14 (Division of rational expressions - 2pts). Divide $f(x)$ by $\frac{x+1}{x+2}$ and simplify.

$f(x)\div\frac{x+1}{x+2}=$ _____

Problem 15 (Composition - 2pts). If $g(x)=x-1$, find the expression for $f\circ g$.

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

Average: 75.74

Problem 16 (Linear System - 4pts). Solve the system

$$\begin{cases} -2x & +y & = & 0 \\ 3x & +y & = & -5 \end{cases}$$

Show all your work, don't just give the answer.
Average: 86.07

Problem 17 (Word problem - 6pts). For some unfathomable reason, a farmer knows that there are 25 heads and 60 legs that belong to his chickens and rabbits, but doesn't know how many of each animal there is. Help! Make sure to write the necessary equations and solve them.

The farmer has _____ chickens
The farmer has _____ rabbits

Average: 52.17

Problem 18 (Expressions - 4pts). Write an algebraic expression for the following verbal statements:

(A) The width of a rectangle is half its length, l. Write an expression for the perimeter of the rectangle in terms of l.

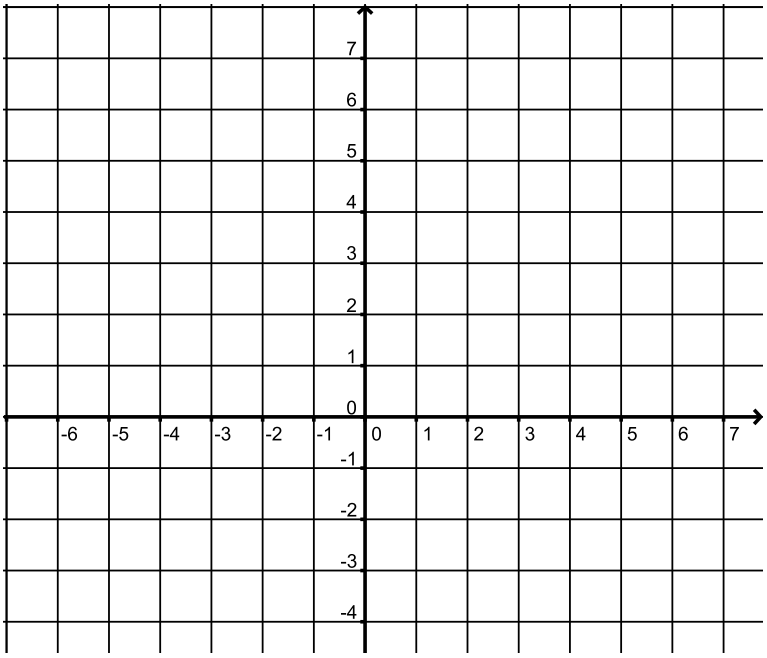
$P =$ _____

(B) Sumin's book cost 3 dollars fewer than twice Aaron's book. If x is the price of Aaron's book, and y is the price of Sumin's book, we can write:

$y =$ _____

Average: 65.19

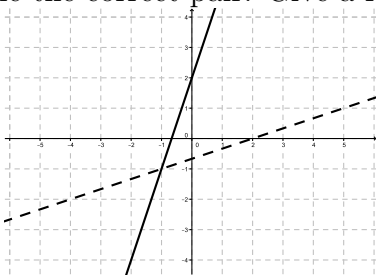
Problem 19 (Straight Lines - 6pts). Find an equation of the line that passes through $(2, -3)$ and has slope $\frac{2}{3}$. Draw its graph.



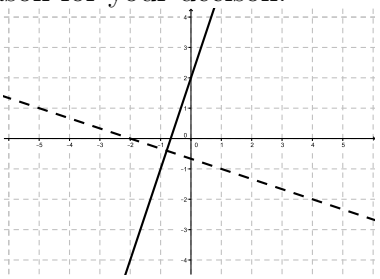
Equation _____

Average: 69.96

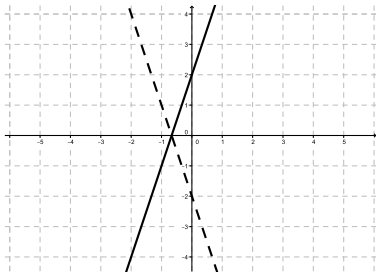
Problem 20 (Inverses - 4pts). One of the figures below depicts $f(x) = 3x + 2$ and its inverse. Circle the correct pair. Give a reason for your decison.



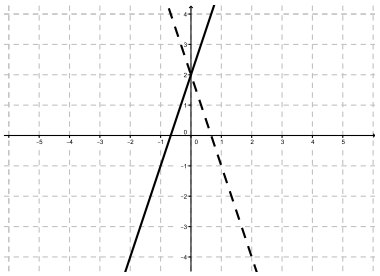
(a)



(b)



(d)



(e)

Explain: _____

Average: 36.31

Problem 21 (Radical Equation - 4pts). Solve the equation

$$\sqrt{x+2} - 3 = 1$$

$x =$ _____

Average: 75.90

Problem 22 (Logarithmic equation - 4pts). Solve the equation

$$\log_2(x-2) = 4$$

$x =$ _____

Average: 68.44

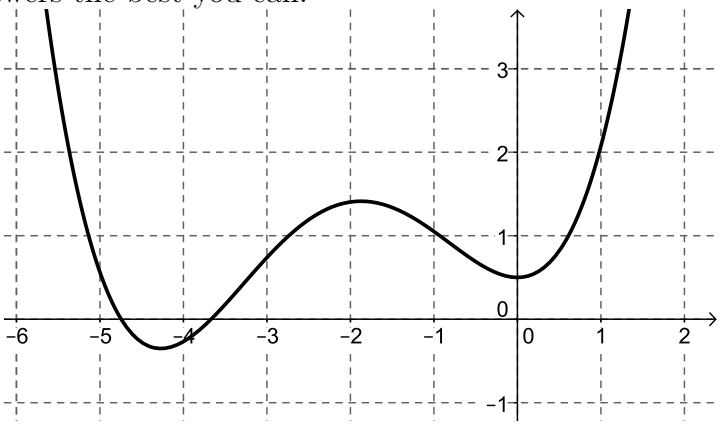
Problem 23 (Exponential equation - 4pts). Solve the equation

$$2^{-x+3} = \frac{1}{8}$$

$x =$ _____

Average: 49.81

Problem 24 (Read the graph - 4pts). A graph of a function f is given below. Estimate the answers the best you can.



(A) List all x-intercepts as ordered pairs: _____

(B) List all y-intercepts as ordered pairs: _____

(C) $f(1) =$ _____

(D) For which x is $f(x) = 1$? _____

Average: 46.32