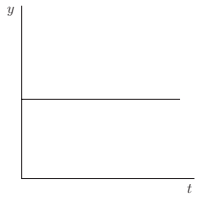
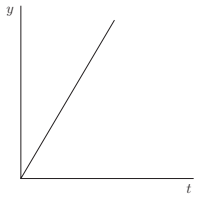
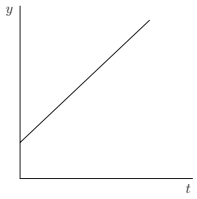
Linear Functions Name:_____

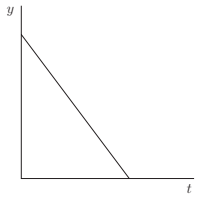
Show all relevant work!

1. Match each graph to the situation it best describes.

(i) 

(ii) 

(iii) 

(iv) 

(a) A bathtub filled with 40 gallons of water is draining at 0.8 gallons per minute until it is empty. The volume of water in the tub is plotted against time.

(b) An elevator starts at the second floor, 20 feet above the ground level, and then rises at 2 feet per second. The height of the elevator is plotted against time.

(c) Larry parks his car 15 feet from his house and stays home for the weekend. The distance Larry's car travels from his house is plotted against time.

(d) An employee earns \$12 per hour. Her income is plotted against time.

2. Write an equation for each situation described in (1).

(a)_____ (b)_____

(c)_____ (d)_____

3. The table for a linear equation is started below.

x		-4	2		
y		7	3		

(a) Fill in the rest of the table.

(b) What is the equation of the line? _____

4. Which of the tables below could represent a linear function?

(a)

t	1	2	3	4	5
$f(t)$	5	5	5	5	5

(b)

x	9	8	7	6	5
$g(x)$	12	16	20	24	28

(c)

t	5	8	12	17	23
$h(t)$	3	5	7	9	11

(d)

x	3	3	3	3	3
$k(x)$	4	2	0	-2	-4

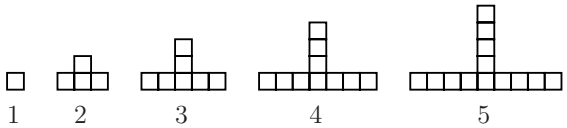
(e)

t	-5	1	7	13	19
$m(t)$	-2	1	-2	1	-2

(f)

t	-6	0	3	9	21
$p(t)$	-8	-4	-2	2	10

5. How many square tiles will it take to make the 3709^{th} figure in the sequence shown to the right?

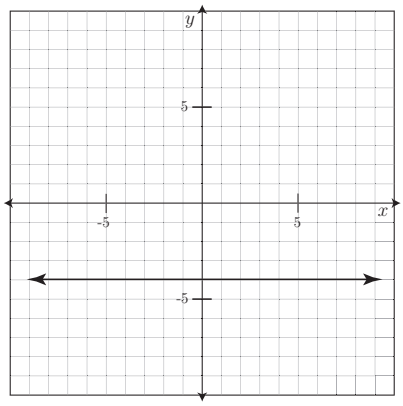


6. Write the equations of the lines graphed below.

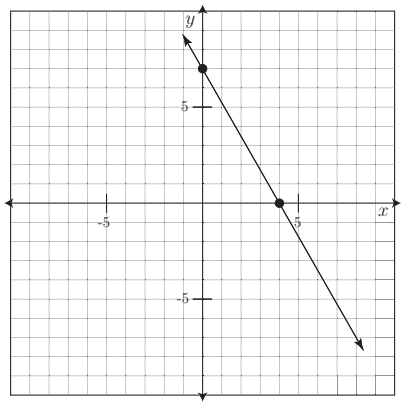
(a) _____

(b) _____

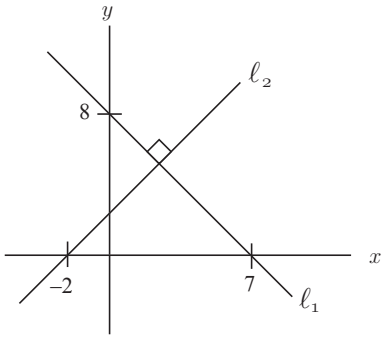
(a)



(b)



7. Find the equation of the line ℓ_2.



8. Using algebra, determine the point of intersection for lines ℓ_1 and ℓ_2 in problem (7) above.

9. A tub drains so that after 5 minutes 30 gallons of water remain in the tub and after 20 minutes, 21 gallons remain.

(a) If the amount of water in the tub is linearly dependent on the time since the drain was opened, write the equation of the volume of water in the tub, V, as a function of time, t.

(b) What does the slope of this line tell you?

(c) How much water is there in the tub when it begins draining?

(d) Find the t–intercept and interpret its meaning in this context.