

In the following problems, calculate the slope of the line between the two given points:

1. (-4, 3) and (5, 10)

$$m = \frac{10-3}{5-(-4)} = \frac{7}{9}$$

2. (-7, -7) and (15, -7)

$$m = \frac{-7-(-7)}{15-(-7)} = \frac{0}{22} = 0$$

3. (-4, -8) and (-4, 11)

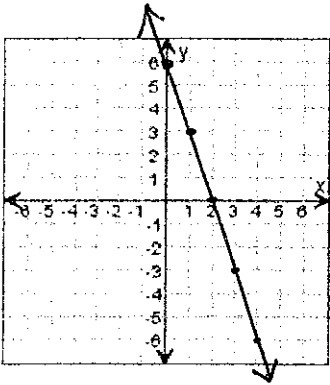
$$\frac{11-(-8)}{-4-(-4)} = \frac{19}{0} \rightarrow \text{undefined}$$

4. (11, 7) and (12, 5)

$$\frac{5-7}{12-11} = \frac{-2}{1} = -2$$

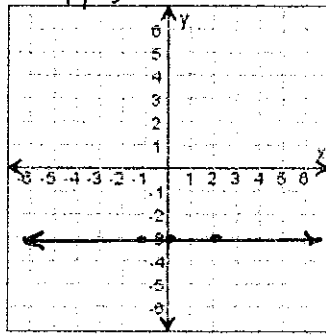
Graph the following lines (in slope-intercept form) on the graphs provided:

5. $y = -3x + 6$



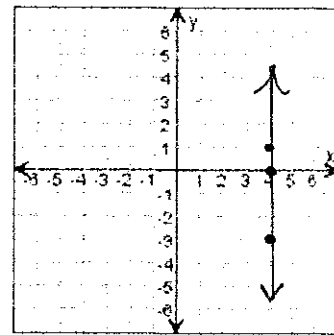
6. $y = -3$

x	y
2	-3
0	-3
-1	-3



7. $x = 4$

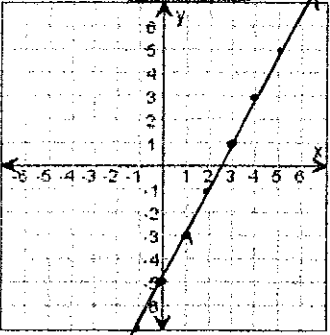
x	y
4	-3
4	0
4	1



8. $y - 1 = 2(x - 3)$

$$y - 1 = 2x - 6$$

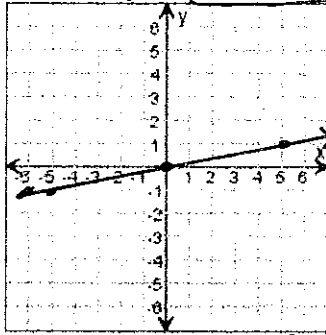
$$y = 2x - 5$$



9. $x - 5y = 0$

$$x = 5y$$

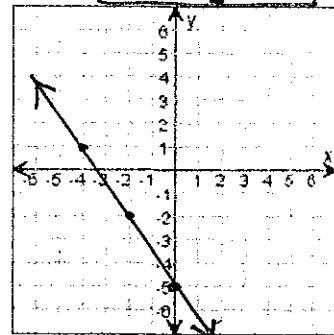
$$y = \frac{1}{5}x$$



10. $y - 1 = \frac{-3}{2}(x + 4)$

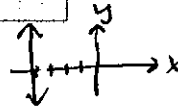
$$y - 1 = \frac{-3}{2}x - 6$$

$$y = \frac{-3}{2}x - 5$$



In the following problems, find both the x and y intercepts.

x	y
-4	0
0	-1



x	y
-3	7
2	7



11. $y = 3x + 6$

Y-int: $(0, 6)$

X-int: $(y=0) \rightarrow 0 = 3x + 6$

$$-6 = 3x, x = -2$$

-2, 0

12. $y = \frac{1}{3}x - 2$

Y-int: $(0, -2)$

X-int: $(y=0) \rightarrow 0 = \frac{1}{3}x - 2$

$$2 = \frac{1}{3}x, x = 6$$

13. $x = -4$

NO Y-int.

X-int: $(-4, 0)$

14. $y = 7$

NO X-int.

Y-int: $(0, 7)$

15. $y = 3x - 1$

Y-int: $(0, -1)$

X-int: $(y=0)$

$$0 = 3x - 1$$

$$1 = 3x \rightarrow x = \frac{1}{3}$$

X-int: $(\frac{1}{3}, 0)$

16. $3x + 2y = 5$

X-int: $(y=0)$

$$3x + 2(0) = 5$$

$$3x = 5$$

$$x = \frac{5}{3}$$

Y-int: $(x=0)$

$$3(0) + 2y = 5$$

$$2y = 5$$

$$y = 2.5$$

17. $-5y + x = 10$

X-int: $(y=0)$

$$-5(0) + x = 10$$

$$x = 10$$

Y-int: $(x=0)$

$$-5y + 0 = 10$$

$$-5y = 10$$

$$y = -2$$

18. $y = \frac{1}{3}x$

X-int: $(y=0)$

$$0 = \frac{1}{3}x$$

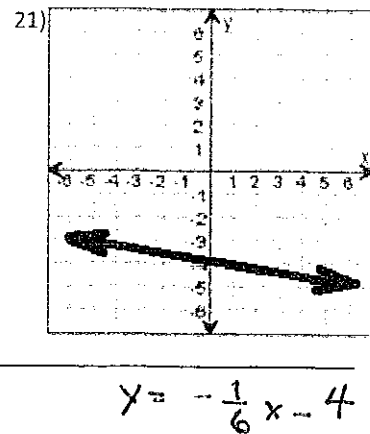
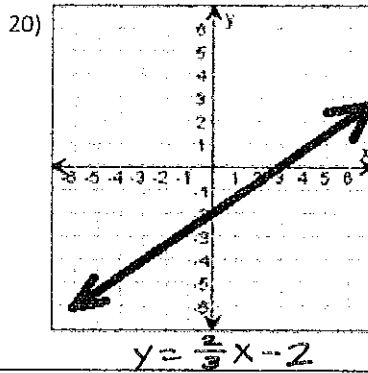
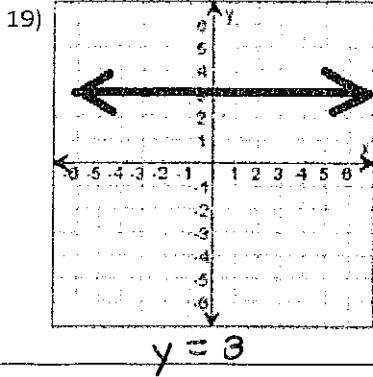
$$3 \cdot 0 = \frac{1}{3}x \cdot 3$$

$$0 = x$$

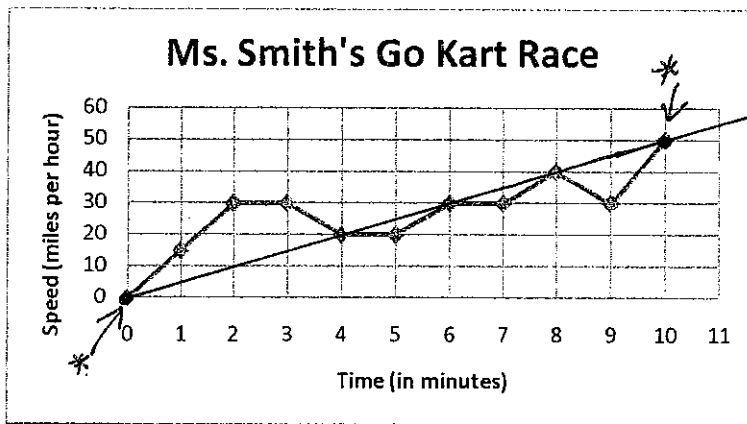
X-int: $(0, 0)$

Y-int: $(0, 0)$

Write the equation of each line given below, in slope-intercept form.



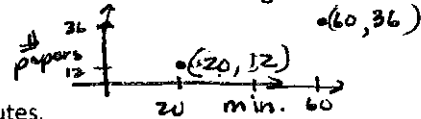
Use the chart below to answer questions 23-26.



- 23) What is the rate of change for Ms. Smith's Go Kart from 0 to 2 minutes? $\frac{30 \text{ mph}}{2 \text{ min}} \rightarrow 15 \text{ mph/min.}$
 Her speed is increasing 15 mph per minute.
- 24) What is the rate of change for Ms. Smith's Go Kart from 2 to 3 minutes?
 0 change, no change - her speed is constant
- 25) What is the rate of change for Ms. Smith's Go Kart from 8 to 9 minutes? $\frac{-10 \text{ mph}}{1 \text{ min}} \rightarrow -10 \text{ mph/min.}$
 Her speed is decreasing 10 mph each minute.
- * 26) What is the average rate of change for Ms. Smith's Go Kart Race?
 $(0,0) (10,50) \text{ slope} = \frac{50-0}{10-0} = \frac{50}{10} = 5 \text{ mph/min}$

State the independent variable and the dependent variable in each situation. Then find the rate of change for each situation. Explain the rate of change in term of the application.

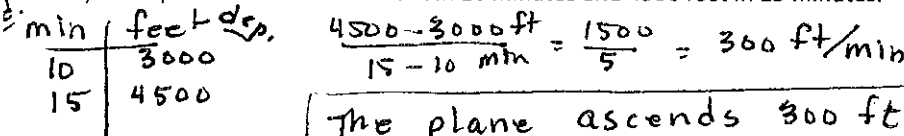
- 27) Shelly delivered 12 newspapers after 20 minutes and 36 papers after 60 minutes.
 indep.: minutes
 depend.: # of papers



- 28) Two pounds of apples cost \$3.98. Six pounds cost \$11.94.
 indep. # pounds
 dep. cost

Shelly can deliver
 • 6 papers per minute.
 or 3 papers every
 5 minutes

- 29) An airplane ascended 3000 feet in 10 minutes and 4500 feet in 15 minutes.



The apples cost \$1.99 per pound.

30) What is the y-intercept of the line described in the table below?

x	f(x)
2	1
3	2
4	3
5	4
6	5

$(0, -1)$

31) What is the difference between the y-intercepts of the line $y = x + 6$ and the line described by the table below?

corrected
g(x)

x	g(x)
-4	9
-3	7
-2	5
-1	3

$6 - 1 = 5$

$(0, 1)$

* What is the difference when the y-intercept of $f(x)$ is subtracted from the y-intercept of $g(x)$?

-1 sub. from $2 \rightarrow 2 - -1 = 3$

32) What is the equation of the line described in the table below?

x	f(x)
1	-5
2	-3
3	-1
4	1
5	3

$y = 2x - 7$

33) What is the difference when the y-intercept of $f(x)$ is subtracted from the y-intercept of $g(x)$ if $g(x) = x - 3$?

4 sub. from -3
 $g(x) \text{ if } g(x) = x - 3$
 $y\text{-int } (x=0) = -3$
 $-3 - 4 = -7$
 $m = \frac{6-2}{-2-2} = \frac{4}{-4} = -1$

x	f(x)
-4	8
-2	6
2	2
4	0

$Y\text{-int of } f(x):$
 $8 = -1(-4) + b$
 $8 = 4 + b$
 $-4 = -4$
 $4 = b$
 $(0, 4)$

34) The Videotastik movie store offers a rental plan that includes a flat yearly membership fee plus a certain amount for each video rented. The total cost can be modeled by the equation shown in the box, where C represents the total cost of membership for one year, and v represents the number of videos rented during the year.

$C = 2v + 22.50$

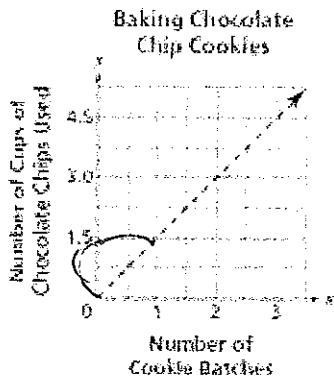
- a) What does C represent? *Cost of renting videos*
- b) What does v represent? *the number of videos rented*
- c) What does 2 represent? *the slope: the cost per video.*
- d) What does 22.50 represent? *the membership fee: the y-intercept*

35) A plumber charges a flat fee to make a service call to any residence plus a certain amount for each hour he is working at a particular residence. The total cost can be modeled by the equation shown in the box, where C represents the total cost of the service call, and h represents the number of hours the plumber worked at the residence.

$C = 35h + 50$

- a) What is the independent variable? *the number of hours the plumber worked*
- b) What is the dependent variable? *total cost of the repair*
- c) What is the slope? What does it represent? *$\$35$ is the slope; it is the hourly rate.*
- d) What is the y-intercept? What does it represent?
50 is the y-intercept. It represents the flat fee (the amount to come to the house)

36) Ms. Jimenez baked chocolate chip cookies for a bake sale. The graph shows the relationship between the number of cookie batches baked and the number of cups of chocolate chips used.



$\frac{1.5 \text{ cups}}{1 \text{ batch of cookies}}$

- a) What is the independent variable? The number of batches of cookies
- b) What is the dependent variable? The number of cups of choc. chips
- c) What is the slope? What does it represent? 1.5 or $\frac{3}{2}$ $\frac{1.5 \text{ cups of cc's}}{\text{per batch of cookies}}$
- d) What is the y-intercept? What does it represent?

or 3 cups of cc
for 2 batches
of cookies

37) Given the following table.

Time (hours)	Distance (miles)
4	260
6	390
8	520
10	650

$\left. \begin{array}{l} +2 \\ +2 \\ +2 \end{array} \right\} +130$
 $\left. \begin{array}{l} +2 \\ +2 \\ +2 \end{array} \right\} +130$
 $\left. \begin{array}{l} +2 \\ +2 \\ +2 \end{array} \right\} +130$

- a) Is the rate of change constant? If not determine the average rate of change? Yes
- b) Is the data linear? Yes; the rate of change is constant
- c) Determine the meaning of the rate of change in the application.

The distance per hour is $\frac{130 \text{ miles}}{2 \text{ hrs}} = 65 \text{ m/h}$.

38) Given the following table.

Hours Spent Studying	Test Grade (Percent)
0	50
1	68
2	80
3	90
4	98

NO

18
12
10
8

$(0, 50)$ $(4, 98)$

$$\frac{98-50}{4-0} = \frac{48}{4} = 12 \frac{\%}{\text{hr}}$$

- a) Is the rate of change constant? If not determine the average rate of change?
- b) Is the data linear? NO the rate of change is not constant.
- c) Determine the meaning of the rate of change in the application.

The rate is 12%. The grade goes up 12% for each additional hour of study.

39) The Common Core Team gives a test where the grade decreases the same number of points every time a problem is missed. Kermit missed 3 questions and made an 88 on the test. Complete the table below, showing the grades (G) as a function of the number of problems missed (W)

No. of problems wrong (W)	0	3	5	9	12
Grade on Test (G)	100	88	80	64	52

i. Which is the NOW-NEXT rule that shows how the grade changes with each problem missed?

- A. Next = Now - 4; Start: 0
- B. Next = Now - 4; Start: 10
- C. Next = Now - 4; Start: 88
- D. Next = Now - 4; Start: 100**

100, 96, 92, 88, 84, 80

Missed x	y Grade
0	100
1	96
2	92
3	88
4	84
5	80

ii. Write a function rule relating test grade G and number of problems wrong W.

- A. $G = 100 - 4W$**
- B. $G = -4W$
- C. $G = -5W + 100$
- D. $G = -3W + 88$

iii. In complete sentences interpret the real world meaning of the slope and y-intercept of the equation.

y-int: (0, 100) → The grade when 0 problems are missed.
 Slope: -4 → The grade goes down 4 points per question missed.

40) Winning Times

The table lists the winning times for the women's 400 meter freestyle swim for the Olympic.

- a) Using 1920 as the base year, plot the data in calc. (Let $x=0$ for 1920)
- b) Determine a linear model (line of best fit) that represents the data.
- c) What is the slope and what does it mean? $y = -1.86x + 361.76$
 $-1.86 \rightarrow$ winning time decreases 1.86 sec/yr.
- d) What is the y-intercept and what does it mean?
 In 1920, the winning time was 361.76
- e) Use the linear regression to predict what the times might have been

if the Olympics had been held in 1940 and 1944.

1940 → "20" 324.55 and 1944 → "24" 317.11

- f) Is it reasonable to use this line to predict the winning time for the 1988 Summer Games? Why or why not? 3 min 55.25 ← 235.25?
- g) Look up the winning time for the 400-meter freestyle swim in the

1988 Summer Games and compare it to the time predicted by the best-fit line?

Janet Evans 4 min 3.85 sec.

Year	Time (Sec.)
4 ← 1924	362.2
8 ← 1928	342.8
12 ← 1932	328.5
16 ← 1936	326.4
28 ← 1948	317.8
32 ← 1952	312.1
36 ← 1956	294.6
40 ← 1960	290.6
44 ← 1964	283.3
48 ← 1968	271.3
52 ← 1972	259
56 ← 1976	249.9
60 ← 1980	248.8
64 ← 1984	247.1

41) Write the slope-intercept form of the equation that is a vertical line through the point $(-7, 13)$.

Points: $(-7, 13)$, $(-7, 10)$, $(-7, -2)$

Table: $\begin{array}{c|c} x & y \\ \hline -7 & 13 \\ -7 & 10 \\ -7 & -2 \end{array}$

Equation: $X = -7$

42) Write the slope-intercept form of the equation that is a horizontal line through the point $(22, -1)$.

Point: $(22, -1)$

Table: $\begin{array}{c|c} x & y \\ \hline -2 & -1 \\ 1 & -1 \\ 22 & -1 \end{array}$

Equation: $Y = -1$

43) Write the slope-intercept form of the equation of the line with a slope of 4 and y-intercept of -2.

Equation: $Y = 4y - 2$

44) Write the slope-intercept form of the equation of the line with a slope of $-\frac{4}{5}$ and y-intercept of 6.

Equation: $Y = -\frac{4}{5}x + 6$

45) Write the slope-intercept form of the equation of the line with a slope of 6 and containing the point $(-3, -1)$.

Equation: $Y = 6x + 17$

46) Write the slope-intercept form of the equation of the line with a slope of $\frac{3}{4}$ and containing the point $(-8, -5)$.

Equation: $Y = \frac{3}{4}x + 1$

47) Write the slope-intercept form of the equation of the line with an undefined slope and containing the point $(-5, -3)$.

Equation: $X = -5$

48) Write the slope-intercept form of the equation of the line with a slope of $-\frac{5}{7}$ and containing the point $(10, -2)$.

Equation: $Y = -\frac{5}{7}x + \frac{36}{7}$

49) Write the slope-intercept form of the equation of the line that has a x-intercept of 3 and a y-intercept of 5.

Equation: $Y = -\frac{5}{3}x + 5$

Points: $(3, 0)$ and $(0, 5)$

50) Write the slope-intercept form of the equation of the line that has a x-intercept of -9 and y-intercept of -1.

Equation: $Y = -\frac{1}{9}x - 1$

51) Write the slope-intercept form of the equation of the line that contains the points $(3, -5)$ and $(5, 6)$.

Equation: $Y = \frac{11}{2}x - \frac{43}{2}$

52) Write the slope-intercept form of the equation of the line that contains the points $(7, 8)$ and $(-2, 8)$.

Equation: $Y = 8$

Label: horizontal line

53) Write the slope-intercept form of the equation of the line that contains the points $(2, 0)$ and $(-5, -6)$.

Equation: $Y = \frac{6}{7}x + \frac{30}{7}$

54) Write the slope-intercept form of the equation of the line that contains the points $(2, 7)$ and $(8, 7)$.

Equation: $X = 2$

Label: vertical