Summer Math Packet for Incoming Algebra 1 Students

Dear Parents,

As you may be aware, Algebra 1 is a High School credit course, and incoming Algebra students will take Algebra EOC STAAR and the HS Credit Final Exam at the end of the school year. So, it could be challenging for those who skip pre-Algebra in eighth-grade math. It requires students to have a solid foundation of math taught in previous math courses, such as Math 6, Math 7, and Math 8. Thus, your students are strongly encouraged to complete this packet by the first day of school (1 topic/day is a good strategy). Please read and discuss the instructions carefully before handing them off to them.

The packet is for incoming Algebra students at Lanier. It is used to identify their learning gaps and should serve as a review of the pre-algebra skills necessary for success in Algebra 1 class. I hope that this review will keep their mind mathematically active during the summer, identify weaknesses in pre-Algebra, if they exist, and prepare them for the challenging year ahead.

When the school year starts, the algebra classes will hit the ground running: no more than one week will be devoted to reviewing these skills and principles from Algebra 1. This assignment will give them a better idea of their readiness as they work through it. I will post the key on the first day of school. Or if they have finished the packet early and need the key to check work, please email Mr. Le at bao.le@houstonisd.org. Students will receive an extra credit grade for the completion of the assignment if they check & correct their wrong answers with the key. Students will have a quiz based on the concepts covered in this packet during the second week of the school year.

Parents are requested to ensure they complete the assignment seriously as directed. Your child's success in the first semester depends on the correct completion of this packet and understanding of the concepts covered. Once they have finished the assignment, please have them explore more videos and extra practice about Algebra on Khan Academy: https://www.khanacademy.org/math/algebra so that they will have a great start to the new challenging school year.

Students: please be aware that **No work = No credit** will be applied and make sure that

- Your answer should be in pencil with step-by-step work shown on this packet or on your notebook.
- Your work must be neat, legible, and organized.
- NO CACULATOR, NO SOFTWARE SOLVER should be involved in this packet.
- If your answer involves radicals or π, give an exact answer in terms of radicals or π.
- If you need more help, please watch tutorial videos in the following link:
  https://sites.google.com/view/bao-le/algebra-1/tutorial-videos

TOPIC 1: SOLVING ONE-STEP EQUATIONS.

Solve each equation.

1) $26 = 8 + v$

2) $3 + p = 8$

3) $15 + b = 23$

4) $-15 + n = -9$

5) $m + 4 = -12$

6) $x - 7 = 13$

7) $m - 9 = -13$

8) $p - 6 = -5$

9) $v - 15 = -27$

10) $n + 16 = 9$

11) $-104 = 8x$

12) $14b = -56$

13) $-6 = \dfrac{b}{18}$

14) $10n = 40$

15) $\dfrac{v}{8} = 2$

16) $16 = \dfrac{k}{11}$

17) $-15x = 0$

18) $-17x = -204$

19) $21 = -7n$

20) $\dfrac{m}{4} = -13$

21) $-126 = 14k$

22) $-143 = -11x$

23) $-16 + x = -15$

24) $-5 = \dfrac{a}{18}$

25) $-17 = x - 15$

26) $n - 8 = -10$

27) $\dfrac{v}{7} = 8$

28) $a + 11 = 20$

29) $-7 + m = 8$

30) $18 + m = 8$

TOPIC 2: SOLVING TWO-STEP EQUATIONS.

Solve each equation.

1) $\dfrac{r}{10} + 4 = 5$

2) $\dfrac{n}{2} + 5 = 3$

3) $3p - 2 = -29$

4) $1 - r = -5$

5) $\dfrac{k - 10}{2} = -7$

6) $\dfrac{n - 5}{2} = 5$

7) $-9 + \dfrac{n}{4} = -7$

8) $\dfrac{9 + m}{3} = 2$

9) $\dfrac{-5 + x}{22} = -1$

10) $4n - 9 = -9$

11) $\dfrac{x + 9}{2} = 3$

12) $\dfrac{-12 + x}{11} = -3$

13) $\dfrac{-4 + x}{2} = 6$

14) $-5 + \dfrac{n}{3} = 0$

15) $\dfrac{p}{4} + 8 = 7$

16) $9 + \dfrac{n}{4} = 15$

17) $6 + \dfrac{x}{2} = 4$

18) $\dfrac{b+11}{3} = -2$

19) $\dfrac{a-10}{3} = -4$

20) $-12r + 4 = 100$

21) $\dfrac{m}{16} - 9 = -8$

22) $-7 + 4r = -15$

23) $\dfrac{m-13}{2} = -8$

24) $-5x + 13 = -17$

25) $\dfrac{k+10}{-2} = 5$

26) $\dfrac{p+8}{-2} = 10$

27) $-14r - 19 = 303$

28) $\dfrac{x}{-4} - 5 = -8$

TOPIC 3: SOLVING MULTI-STEP EQUATIONS.

Solve each equation.

1) $4n - 2n = 4$

2) $-12 = 2 + 5v + 2v$

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

4) $x + 3 - 3 = -6$

5) $-12 = 3 - 2k - 3k$

6) $-1 = -3r + 2r$

7) $6 = -3(x + 2)$

8) $-3(4r - 8) = -36$

9) $24 = 6(-x - 3)$

10) $75 = 3(-6n - 5)$

11) $-3(1 + 6r) = 14 - r$

12) $6(6v + 6) - 5 = 1 + 6v$

13) $-4k + 2(5k - 6) = -3k - 39$

14) $-16 + 5n = -7(-6 + 8n) + 3$

15) $10p + 9 - 11 - p = -2(2p + 4) - 3(2p - 2)$

16) $-10n + 3(8 + 8n) = -6(n - 4)$

17) $10(x + 3) - (-9x - 4) = x - 5 + 3$

18) $12(2k + 11) = 12(2k + 12)$

19) $-12(x - 12) = -9(1 + 7x)$

20) $-11 + 10(p + 10) = 4 - 5(2p + 11)$

Critical thinking question:

21) Explain two ways you could solve $20 = 5(-3 + x)$

TOPIC 4: SOLVING ONE-STEP INEQUALITIES.

Solve each inequality and graph its solution.

1) $-12 > x - 7$
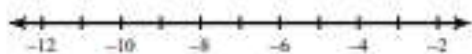
2) $-1 + r \geq 4$

3) $n - 6 \leq -14$

4) $b - 7 < -12$
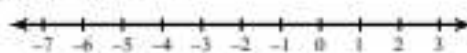
5) $a - 17 > -16$
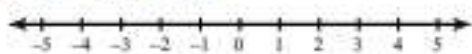
6) $15 + x \leq 0$

7) $3 + v \leq -9$

8) $8 \geq n - 6$

9) $-3x > 3$

10) $\dfrac{n}{3} > 3$

11) $\dfrac{k}{4} < -4$
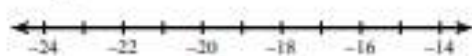
12) $-9x \geq -90$

13) $0 \geq 7n$

14) $\frac{m}{5} \geq -5$
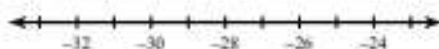
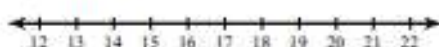15) $-13x < -156$

16) $32 \geq -16p$
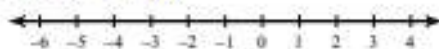
17) $-8 > v - 3$

18) $11 \leq 5 + x$

19) $25 \geq n + 13$

20) $-168 > -12a$
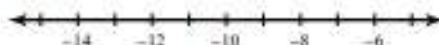

21) $-3 \leq x - 4$

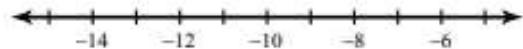22) $\frac{r}{3} > 6$
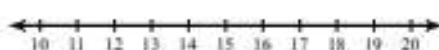
23) $12n \geq 84$
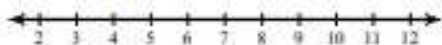
24) $-22 > -10 + b$

TOPIC 5: SOLVING TWO-STEP INEQUALITIES.

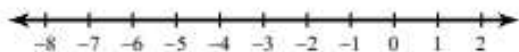**Solve each inequality and graph its solution.**
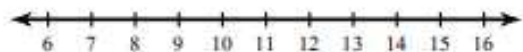
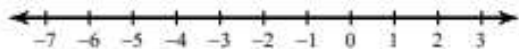1) $\dfrac{n}{3} + 2 > 0$

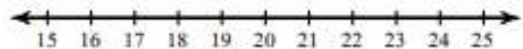2) $\dfrac{p}{9} - 1 \le -2$

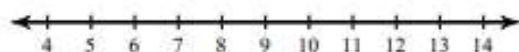3) $\dfrac{x}{1} + 5 > 5$
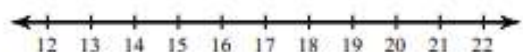

4) $\dfrac{1+m}{9} \ge 1$

5) $-2r - 2 \le 4$

6) $8x + 2 \le 138$
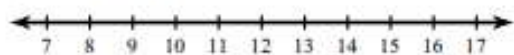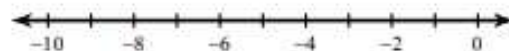

7) $3 + \dfrac{b}{9} < 4$

8) $9 + \dfrac{n}{2} > 16$

9) $-7v + 5 \geq -79$

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<----+---+---+---+---+---+---+---+---+---+---+---->
     7   8   9   10  11  12  13  14  15  16  17
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10) $\dfrac{n+3}{2} > -2$

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<---+-----+-----+-----+-----+-----+--->
   -10    -8    -6    -4    -2     0
```

11) $4 > \dfrac{a+1}{2}$

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<----+---+---+---+---+---+---+---+---+---+---+---->
     1   2   3   4   5   6   7   8   9   10  11
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12) $-2 + \dfrac{x}{2} > 6$

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<----+----+----+----+----+----+----+----+----+----+----->
    11   12   13   14   15   16   17   18   19   20   21
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13) $60 > 5 - 5n$

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<----+----+----+----+----+----+----+----+----->
        -12      -10      -8       -6       -4
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14) $\dfrac{x+1}{2} \geq -4$

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<----+----+----+----+----+----+----+----+----->
        -12      -10      -8       -6       -4
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15) $6 \leq 5 + \dfrac{p}{20}$

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<----+----+----+----+----+----+----+----+----+----+----->
    17   18   19   20   21   22   23   24   25   26   27
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16) $-18 + \dfrac{k}{3} \leq -26$

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<----+----+----+----+----+----+----+----->
    -28      -26      -24      -22      -20      -18
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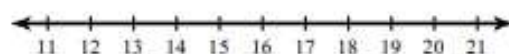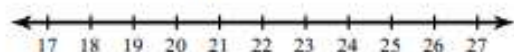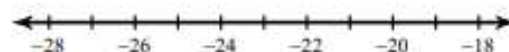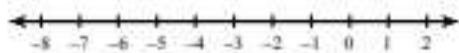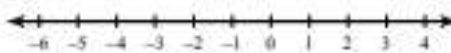
TOPIC 6: SOLVING MULTI-STEP INEQUALITIES.

Solve each inequality and graph its solution.

1) $3 < -5n + 2n$

2) $6x + 2 + 6x < 14$

3) $-p - 4p > -10$

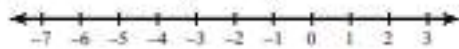4) $18 \geq 5k + 4k$

5) $9 \geq -2m + 2 - 3$

6) $-3 - 6(4x + 6) > -111$

7) $6 - 4(6n + 7) \geq 122$

8) $-138 \geq -6(6b - 7)$
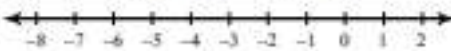
9) $167 < 6 + 7(2 - 7r)$

10) $5(6 + 3r) + 7 \geq 127$

11) $-8x + 2x - 16 < -5x + 7x$
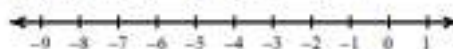
12) $-1 - 6x - 6 > -11 - 7x$

13) $a - 6 \leq 15 + 8a$
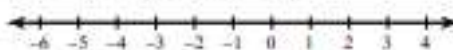

14) $13 + 2v - 8 + 6 > -7 - v$

15) $-5n - 6n \leq 8 - 8n - n$

16) $-x < -x + 7(x - 2)$
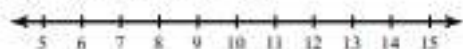

17) $-5n + 6 \geq -7(5n - 6) - 6n$
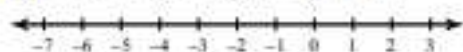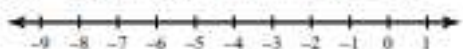

18) $3(p - 3) - 5p > -3p - 6$
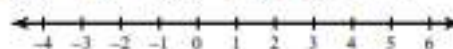

19) $28 - k \geq 7(k - 4)$

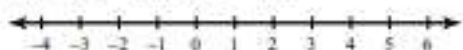20) $28 - 7x \leq -4(-7x - 7)$
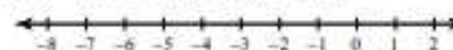

21) $-6(1 + 7k) + 7(1 + 6k) \leq -2$

22) $-2(2 - 2x) - 4(x + 5) \leq -24$

23) $3(1 - 2x) > 3 - 6x$

24) $-2(5 + 6n) < 6(8 - 2n)$

TOPIC 7: SOLVING EQUATION WORD PROBLEMS.

1) 331 students went on a field trip. Six buses were filled and 7 students traveled in cars. How many students were in each bus?

2) Aliyah had $24 to spend on seven pencils. After buying them she had $10. How much did each pencil cost?

3) The sum of three consecutive numbers is 72. What are the smallest of these numbers?

4) The sum of three consecutive even numbers is 48. What are the smallest of these numbers?

5) You bought a magazine for $5 and four erasers. You spent a total of $25. How much did each eraser cost?

6) Maria bought seven boxes. A week later half of all her boxes were destroyed in a fire. There are now only 22 boxes left. With how many did she start?

7) Sumalee won 40 super bouncy balls playing horseshoes at her school's game night. Later, she gave two to each of her friends. She only has 8 remaining. How many friends does she have?

8) Imani spent half of her weekly allowance playing mini-golf. To earn more money her parents let her wash the car for $4. What is her weekly allowance if she ended with $12?

9) Aliyah had some candy to give to her four children. She first took ten pieces for herself and then evenly divided the rest among her children. Each child received two pieces. With how many pieces did she start?

10) How old am I if 400 reduced by 2 times my age is 244?

11) Jill sold half of her comic books and then bought sixteen more. She now has 36. With how many did she begin?

12) For a field trip 4 students rode in cars and the rest filled nine buses. How many students were in each bus if 472 students were on the trip?

13) On Tuesday Shanice bought five hats. On Wednesday half of all the hats that she had were destroyed. On Thursday there were only 17 left. How many did she have on Monday?

14) The Cooking Club made some pies to sell at a basketball game to raise money for the new math books. The cafeteria contributed four pies to the sale. Each pie was then cut into five pieces and sold. There were a total of 60 pieces to sell. How many pies did the club make?

TOPIC 8: SOLVING INEQUALITY WORD PROBLEMS.

1) Keith has $500 in a savings account at the beginning of the summer. He wants to have at least $200 at the end of the summer. He withdraws $25 per week for food, clothing, and movie tickets. How many weeks can Keith withdraw money from his account?

2) A taxi charges a flat rate of $1.75, plus an additional $0.65 per mile. If Erica has at most $10 to spend on the cab ride, how far could she travel?

3) Chris wants to order DVD's over the internet. Each DVD costs $15.99 and shipping the entire order costs $9.99. If he can spend no more than $100, how many DVD's could he buy?

4) Allison practices her violin for at least 12 hours per week. She practices for three fourths of an hour each session. If Allison has already practiced 3 hours this week, how many more sessions remain for her to meet or exceed her weekly practice goal?

5) Pet Supplies makes a profit of $5.50 per bag on its line of natural dog food. If the store wants to make a profit of no less than $5225, how many bags of dog food does it need to sell?

6) Ryan is a wrestler trying to make weight. He currently weighs 200 lbs. If he cuts 2 lbs. per week, how many weeks will it take him to weigh less than 175 lbs.?

7) Tom is deciding whether or not he should become a member gym to use their basketball courts. The membership cost is $135. Members pay $2 to rent out the basketball courts. Non-members can rent the court also, but they have to pay $11 each time. how many times would Tom need to rent the court in order for it be cheaper to be a member than a non member?

TOPIC 9: PROPORTIONAL RELATIONSHIPS.

State if each pair of ratios forms a proportion.

1) $\dfrac{4}{2}$ and $\dfrac{20}{6}$

2) $\dfrac{3}{2}$ and $\dfrac{18}{8}$

3) $\dfrac{4}{3}$ and $\dfrac{16}{12}$

4) $\dfrac{4}{3}$ and $\dfrac{8}{6}$

5) $\dfrac{12}{24}$ and $\dfrac{3}{4}$

6) $\dfrac{6}{9}$ and $\dfrac{2}{3}$

Solve each proportion.

7) $\dfrac{10}{k} = \dfrac{8}{4}$

8) $\dfrac{m}{10} = \dfrac{10}{3}$

9) $\dfrac{2}{x} = \dfrac{7}{9}$

10) $\dfrac{3}{x} = \dfrac{7}{10}$

11) $\dfrac{4}{9} = \dfrac{2}{x}$

12) $\dfrac{6}{a} = \dfrac{3}{8}$

13) $\dfrac{8n}{8} = \dfrac{8}{3}$

14) $\dfrac{7}{9} = \dfrac{a}{5}$

15) $\dfrac{p}{8} = \dfrac{13}{2}$

16) $\dfrac{3}{13} = \dfrac{v}{3}$

17) $\dfrac{10}{12} = \dfrac{2}{n}$

18) $\dfrac{11}{10} = \dfrac{r}{11}$

19) $\dfrac{x}{9} = \dfrac{7}{14}$
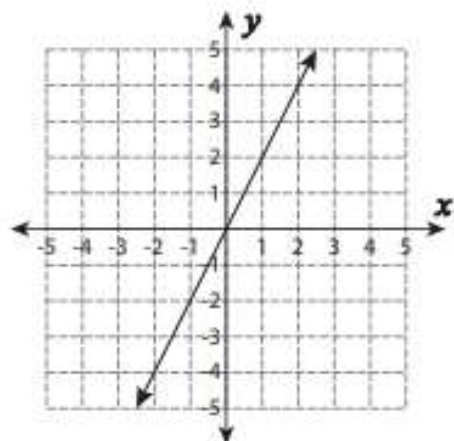
20) $\dfrac{a}{10} = \dfrac{11}{14}$

21) $\dfrac{v}{12} = \dfrac{10}{2}$
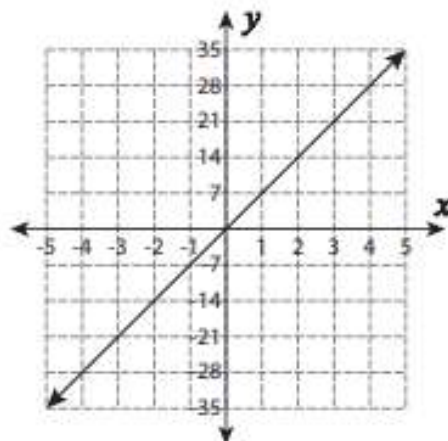
22) $\dfrac{6}{14} = \dfrac{5}{n}$

TOPIC 10: CONSTANT OF PROPORTIONALITY.

Identify the constant of proportionality(k) for each graph and write the proportional relationship ($y = kx$).
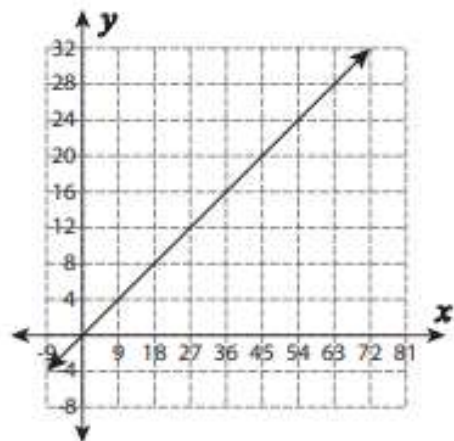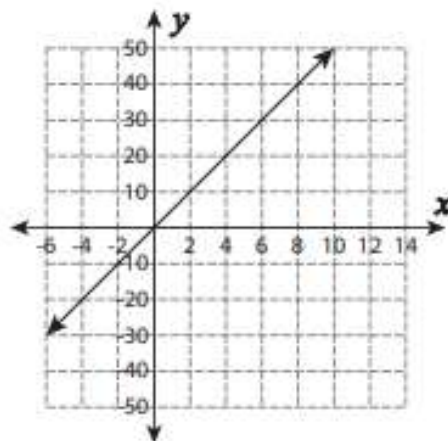
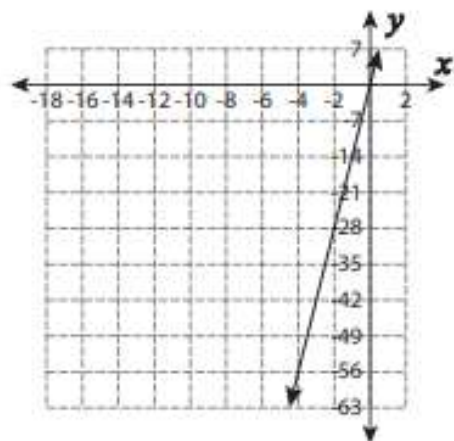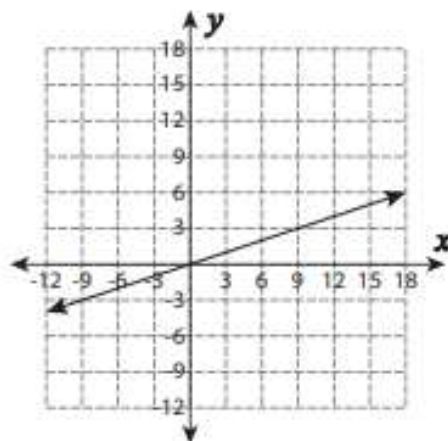1)

_____

2)

_____

3)

_____

4)

_____

5)

_____

6)

_____

Draw the graph to show the proportional relationship $y = kx$.

1) $k = 2$
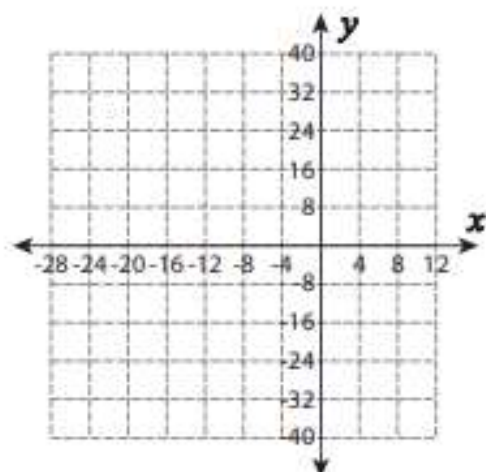
2) $k = \dfrac{2}{9}$
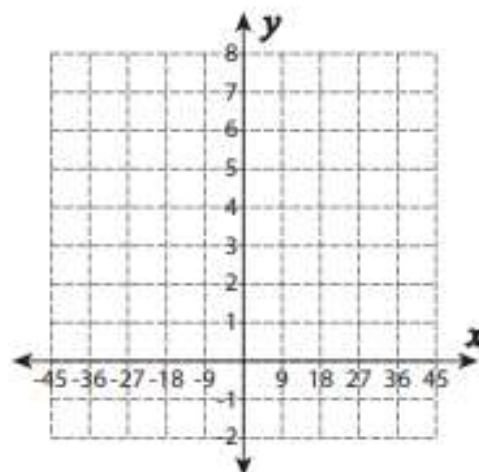
3) $k = \dfrac{3}{4}$
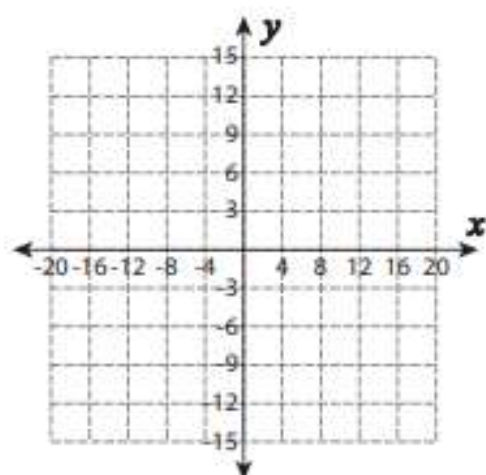
4) $k = 6$
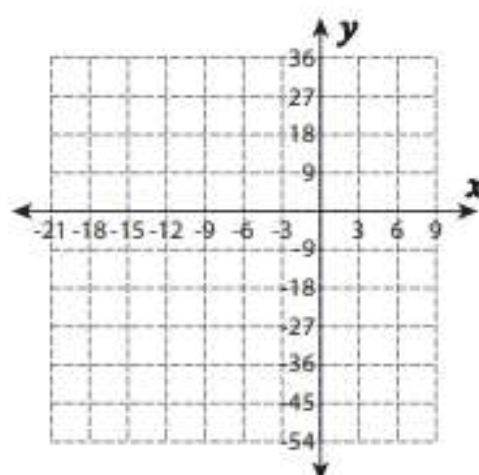
5) $k = 1$
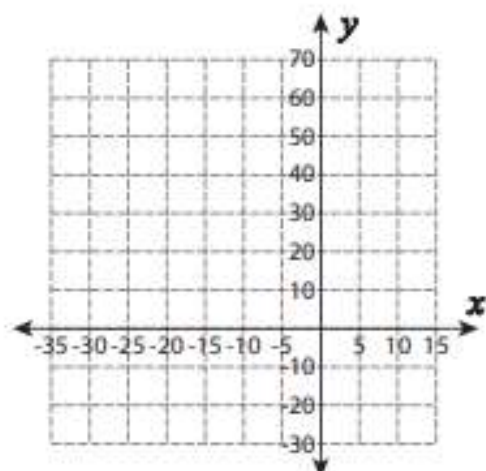
6) $k = \dfrac{5}{7}$
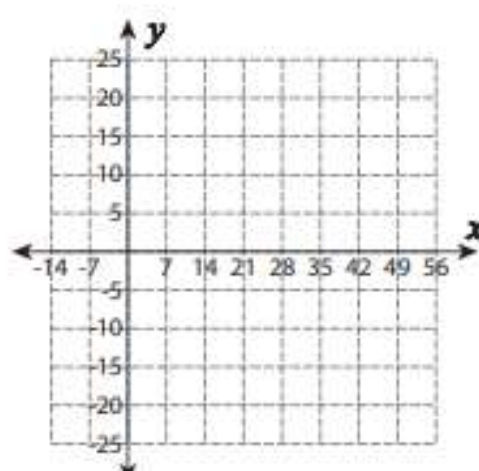
TOPIC 11: SLOPE OF LINEAR FUNCTIONS.

Find the slope of each line.

1) $y = -\dfrac{5}{2}x - 5$

2) $y = -\dfrac{4}{3}x - 1$

3) $y = -x + 3$

4) $y = -4x - 1$

5) $2x - y = 1$

6) $x + 2y = -8$

7) $8x + 3y = -9$

8) $4x + 5y = -10$

11) $3x + 2y = 6$

12) $4x - 5y = 0$

13) $y = -1$

14) $x + 5y = -15$

15) $-2y - 10 + 2x = 0$

16) $x + 5 + y = 0$

17) $3x + 20 = -4y$

18) $-15 - x = -5y$

19) $-1 = -2x + y$

20) $-x - 1 = y$

21) $0 = 5y - x$

22) $-30 + 10y = -2x$

Find the slope of each line.

1)
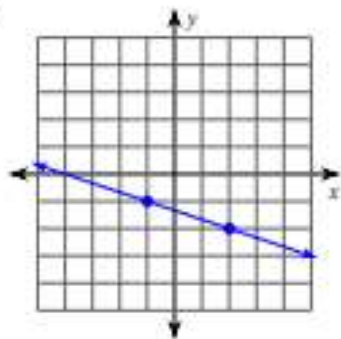
2)
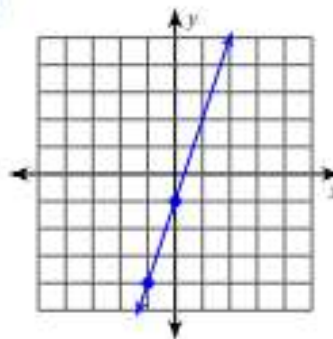
3)
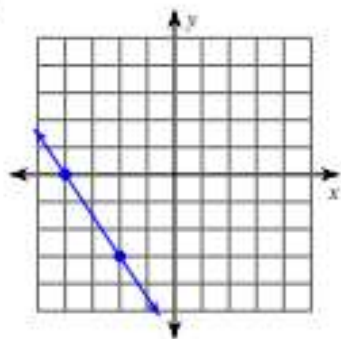
4)
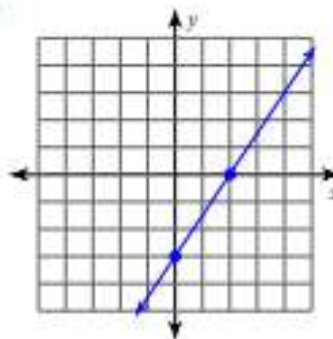
5)
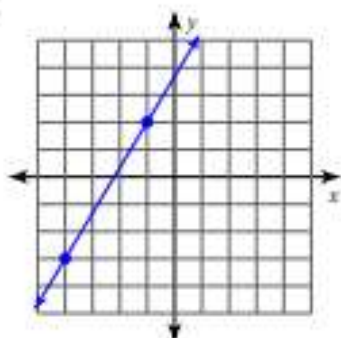
6)
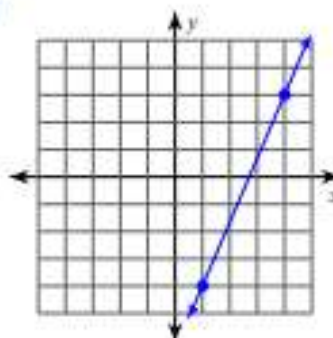
7)
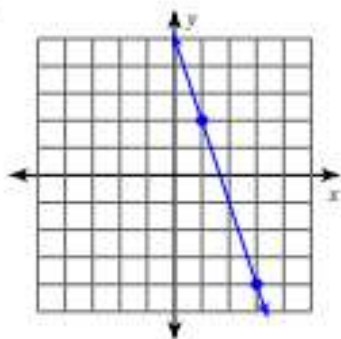
8)
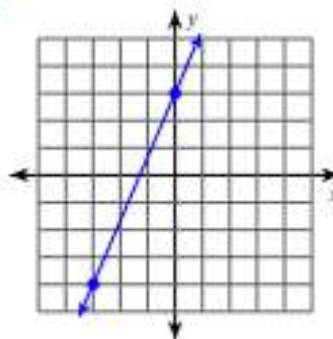
Find the slope of the line through each pair of points.

9) $(8, 10), (-7, 14)$

10) $(-3, 1), (-17, 2)$

11) $(-20, -4), (-12, -10)$

12) $(-12, -5), (0, -8)$

13) $(-19, -6), (15, 16)$

14) $(-6, 9), (7, -9)$

15) $(-18, -20), (-18, -15)$

16) $(12, -18), (11, 12)$

Find the slope of each line.

17) $y = -5x - 1$

18) $y = \frac{1}{3}x - 4$

19) $y = -\frac{1}{5}x - 4$

20) $x = 1$

21) $y = \frac{1}{4}x + 1$

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

23) $y = -x + 2$

24) $y = -x - 1$

25) $2x + 3y = 9$

26) $5x + 2y = 6$

TOPIC 12: GRAPHING LINEAR FUNCTIONS.

Sketch the graph of each line.

1) $y = \dfrac{7}{2}x - 2$
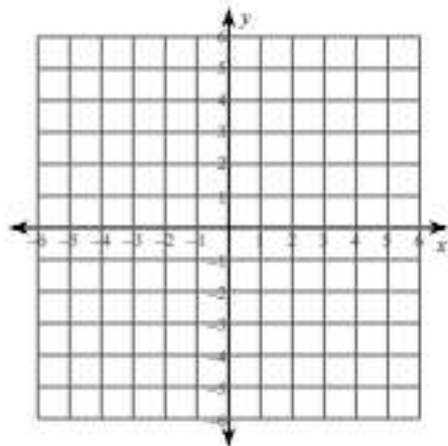
2) $y = -6x + 3$
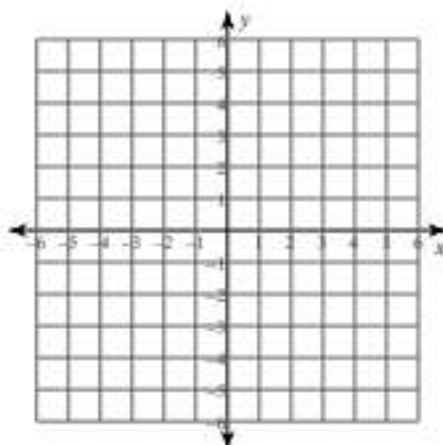
3) $y = -5$
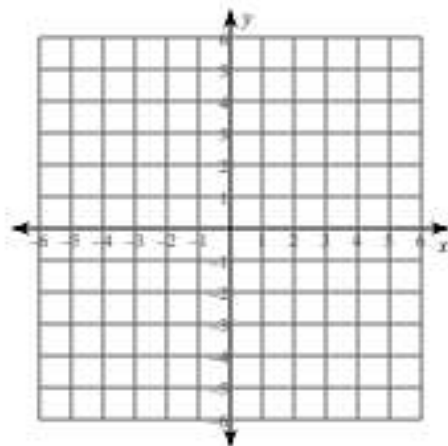
4) $y = \dfrac{6}{5}x + 1$
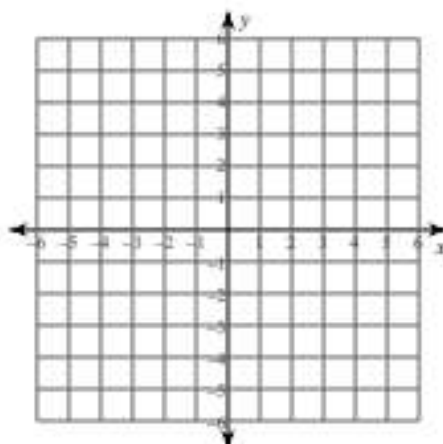
5) $y = \dfrac{1}{4}x + 2$
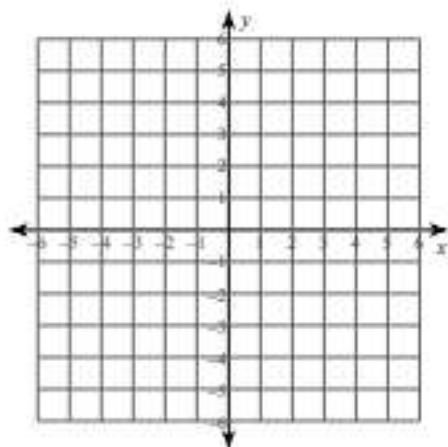
6) $x = 5$
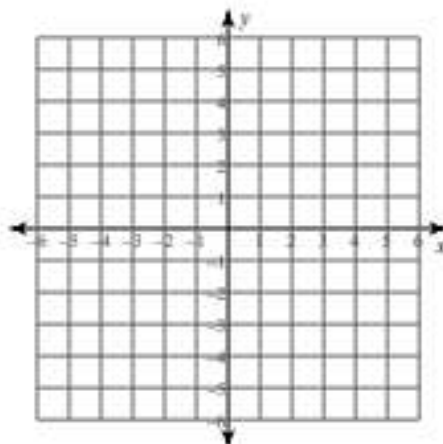
7) $y = \dfrac{5}{3}x$
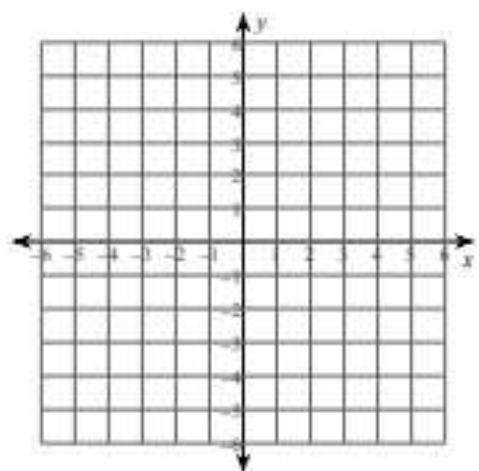
8) $x = 0$
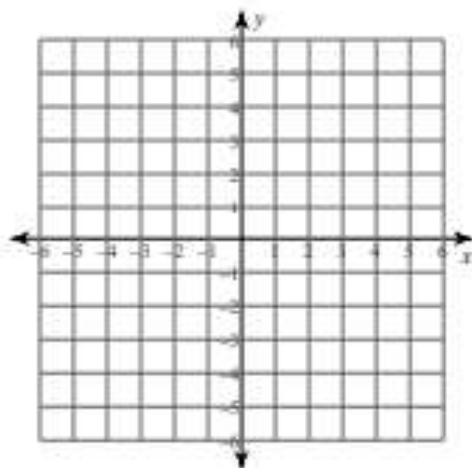
9) $y = -\dfrac{1}{3}x + 3$
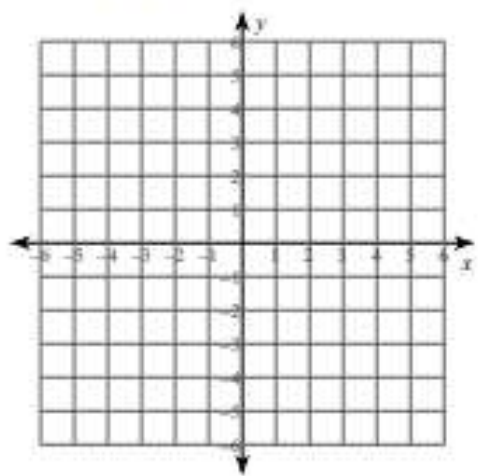
10) $y = \dfrac{1}{5}x - 4$
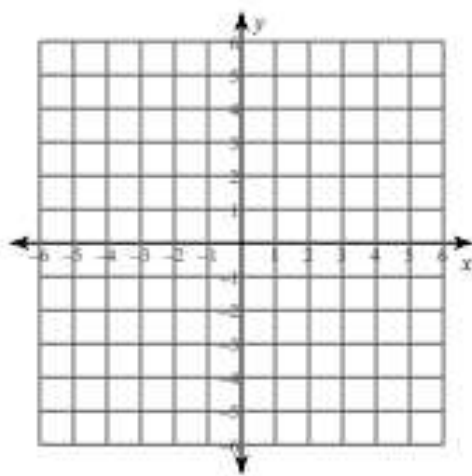
11) $y = \dfrac{1}{2}x - 2$
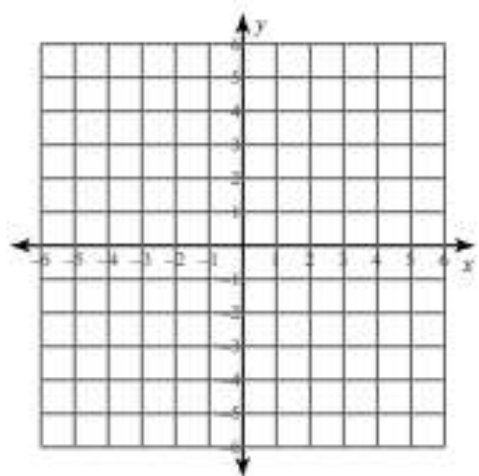
12) $y = 2x + 5$
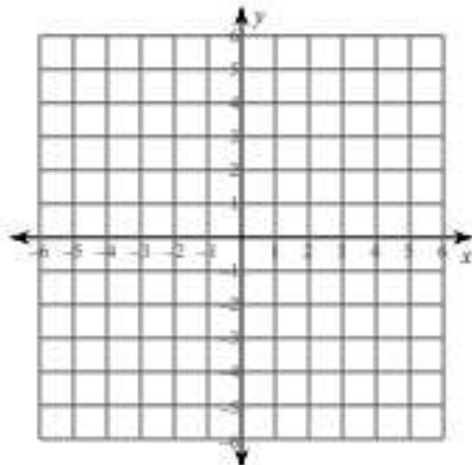
TOPIC 13: WRITING LINEAR FUNCTIONS.

Write the slope-intercept form of the equation of each line.

1) $3x - 2y = -16$

2) $13x - 11y = -12$

3) $9x - 7y = -7$

4) $x - 3y = 6$

5) $6x + 5y = -15$

6) $4x - y = 1$

7) $11x - 4y = 32$

8) $11x - 8y = -48$

Write the standard form of the equation of the line through the given point with the given slope.

9) through: $(1, 2)$, slope $= 7$

10) through: $(3, -1)$, slope $= -1$

11) through: $(-2, 5)$, slope $= -4$

12) through: $(3, 5)$, slope $= \dfrac{5}{3}$

13) through: $(2, -4)$, slope $= -1$

14) through: $(2, 5)$, slope $=$ undefined

15) through: $(3, 1)$, slope $= \dfrac{1}{2}$

16) through: $(-1, 2)$, slope $= 2$

Write the point-slope form of the equation of the line described.

17) through: $(4, 2)$, parallel to $y = -\dfrac{3}{4}x - 5$

18) through: $(-3, -3)$, parallel to $y = \dfrac{7}{3}x + 3$

19) through: $(-4, 0)$, parallel to $y = \dfrac{3}{4}x - 2$

20) through: $(-1, 4)$, parallel to $y = -5x + 2$

21) through: $(2, 0)$, parallel to $y = \dfrac{1}{3}x + 3$

22) through: $(4, -4)$, parallel to $y = -x - 4$

23) through: $(-2, 4)$, parallel to $y = -\dfrac{5}{2}x + 5$

24) through: $(-4, -1)$, parallel to $y = -\dfrac{1}{2}x - 1$

1) Jimmy is having a birthday party at the zoo. The zoo has a fixed fee for birthday parties, plus a fee per person. Jimmy is told the total charge for 10 people, including himself, would be $97.50 and the total charge for 20 people, including himself, would be $175. Determine the:

a. independent and dependent variables

b. rate of change   c. initial value

d. the total charge for 17 people   e. the number of people who could come for $500

2) Jimmy is driving home from a vacation. His car is on cruise control so he maintains a constant speed. After 3 hours of driving, he is 740km from home. After 6 hours, he is 461km from home. Determine the:

a. independent and dependent variables

b. rate of change   c. initial value

d. distance after 8 h and 15 m.   e. time it will take him to get home?

3) Jimmy and Karen rented cars from the same company. The company charges an initial fee plus a charge per km. Jimmy drove 240km and was charged $59.40. Karen drove 490km and was charged $74.40. Determine the:

a. rate of change   b. initial cost

c. the charge after 837km   d. the number of km you can drive for $200

4) An insurance company has an initial charge to insure jewelry, plus a charge per dollar value of the jewelry. A ring with a value of $3500 costs $189.50 to insure. A ring with a value of $5900 costs $297.50 to insure. Determine the:

a. Rate of Change

b. Initial charge

c. Cost to insure a $12 000 ring

d. The value of a ring you could insure for $100

5) A school decides to sell t-shirts to raise money. If they sell 20 shirts, they will lose $30. If they sell 100 shirts, they will make $650. Determine the:

a. rate of change

b. initial value

c. number of shirts they need to sell to break even

6) Lanny got a short term job selling computers. He is paid on commission. In order to impress customers, he bought a few nice suits. If he has $20 000 in sales, he will lose $140. If he has $30 000 in sales, he will make a $90 profit. Determine the:

a. rate of change and initial value

b. the amount he needs to sell to break even

c. The amount he needs to sell in order to make $1000 profit

TOPIC 14: EVALUATE THE VALUE OF THE EXPRESSION.

Evaluate each using the values given.

1) $y \div 2 + x$; use $x = 1$, and $y = 2$

2) $a - 5 - b$; use $a = 10$, and $b = 4$

3) $p^2 + m$; use $m = 1$, and $p = 5$

4) $y + 9 - x$; use $x = 1$, and $y = 3$

5) $m + p \div 5$; use $m = 1$, and $p = 5$

6) $y^2 - x$; use $x = 7$, and $y = 7$

7) $z(x + y)$; use $x = 6$, $y = 8$, and $z = 6$

8) $x + y + y$; use $x = 9$, and $y = 10$

9) $p^3 + 10 + m$; use $m = 9$, and $p = 3$

10) $6q + m - m$; use $m = 8$, and $q = 3$

11) $p^2 m \div 4$; use $m = 4$, and $p = 7$

12) $y - (z + z^2)$; use $y = 10$, and $z = 2$

13) $z - (y \div 3 - 1)$; use $y = 3$, and $z = 7$

14) $(y + x) \div 2 + x$; use $x = 1$, and $y = 1$

15) $p - (9 - (m + q))$; use $m = 4$, $p = 5$, and $q = 3$

16) $(a^2 - b) \div 6$; use $a = 5$, and $b = 1$

17) $(6 + h^2 - j) \div 2$; use $h = 6$, and $j = 4$

18) $y - (4 - x - y \div 2)$; use $x = 3$, and $y = 2$

19) $x^3 \div 3 - y$; use $x = 3$, and $y = 1$

20) $(p + q)^2 - (5 - 5)$; use $p = 1$, and $q = 1$

21) $12k - h^2$; use $h = 2$, and $k = 3$

22) $y \div 5 + 1 + x \div 6$; use $x = 6$, and $y = 5$

23) $6 \div 6 + z + x - y$; use $x = 2$, $y = 5$, and $z = 6$

24) $y - z + xz \div 6$; use $x = 3$, $y = 4$, and $z = 4$

25) $\frac{y}{2} + x + 4 + z + y$; use $x = 7$, $y = 2$, and $z = 4$

26) $c \times \frac{bc}{4} - (7 - a)$; use $a = 4$, $b = 8$, and $c = 5$

TOPIC 15: PROPORTIONAL Vs. NONPROPORTIONAL

For #1 – 4, Use a table to solve. Then explain your reasoning.

1. Fun Center rents popcorn machines for $20 per hour. In addition to the hourly charge, there is a rental fee of $32. Is the number of hours you rent the popcorn machine proportional to the total cost?

Hours	1	2	3	4
Cost ($)				

2. Mrs. Govin is making cakes for the school bake sale. She needs 2 cups of sugar for every cake she makes. Is the number of cakes Mrs. Govin makes proportional to the number of cups of sugar?

Cakes	1	2	3	4
Sugar (cups)				

3. At a local music store, CDs cost $11.99 including tax. Is the number of CDs purchased proportional to the cost of the CDs?

CDs	1	2	3	4
Cost ($)				

4. Jean has $280 in her savings account. Starting next week, she will deposit $30 in her account every week. Is the amount of money in her account proportional to the number of weeks?

Weeks	1	2	3	4
Savings ($)				

For Exercises 5 and 6, determine whether the relationship between the two quantities shown in each table are proportional by graphing on the coordinate plane. Explain your reasoning.

5.

Temperature (Degrees)	
Celsius	Fahrenheit
0	32
5	41
10	50
15	59
20	68

Temperature
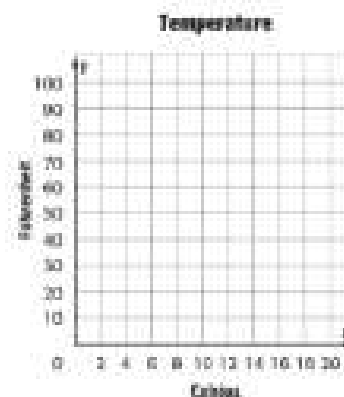
6.

Popcorn	
Bags of Popcorn	Cost ($)
0	0
1	4
2	8
3	12
4	16

Popcorn
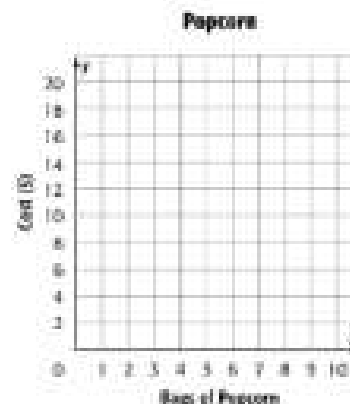
7. **MOVIES** An online DVD rental company charges $15 a month for unlimited rentals. Determine whether the total paid after each month is proportional to number of months by graphing on the coordinate plane. Explain your reasoning.

Online DVD Rentals
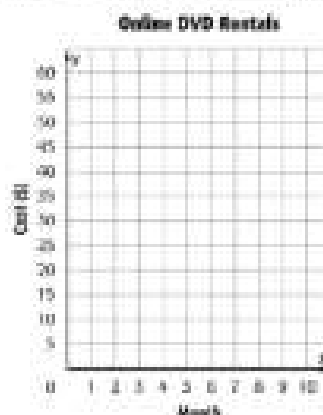
TOPIC 16: LINEAR Vs. NONNONLINEAR

A) Determine whether each function table is linear or nonlinear.

1)

x	−16	−3	11	15
$f(x)$	−24	−11	3	7

_____

2)

x	1	4	6	7
$f(x)$	−7	23	63	89

_____

3)

x	−7	0	9	12
$f(x)$	−10	−3	6	9

_____

4)

x	−9	−6	−1	14
$f(x)$	−7	−7	2	16

_____

5)

x	−3	2	13	17
$f(x)$	−21	−26	59	41

_____

6)

x	−14	−10	−5	−4
$f(x)$	−11	−7	−2	−1

_____

7)

x	−18	−14	−12	0
$f(x)$	2	4	5	11

_____

8)

x	−16	3	8	21
$f(x)$	25	−11	44	51

_____

B) 1) Which of the following tables represents a linear function?

a)

x	−2	0	6	9
$f(x)$	0	−4	45	96

b)

x	3	7	11	14
$f(x)$	17	37	57	72

c)

x	−7	−6	1	3
$f(x)$	40	16	0	7

2) Which of the following tables represents a nonlinear function?

a)

x	1	3	9	10
$f(x)$	−3	−1	5	6

b)

x	−10	2	15	20
$f(x)$	−51	9	74	99

c)

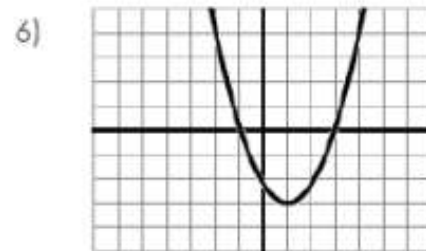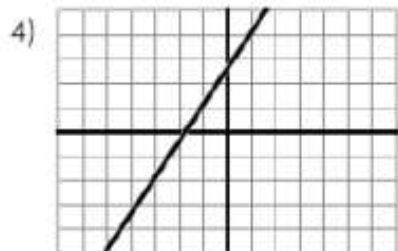| x	−8	−3	4	6
$f(x)$	65	2	17	37

Tell whether the equation, graph, or table shows a linear or nonlinear function. If it is linear, is it increasing or decreasing? Remember to _explain_ your answers.

1) $y = 3 - 4x^2$

2) $y = 4x - 6$

3) $y = 1.05^x$

4)

5)

6)

7)

x	y
-2	0.111
-1	0.333
0	1
1	3
2	9

8)

x	y
-2	7
-1	2
0	-1
1	-2
2	-1

9)

x	y
-2	-2
-1	1
0	4
1	7
2	10

In the following problems, tell if the equation is linear or nonlinear. Also tell why you think it is linear or nonlinear.

9. $y = 4x^2 + 2x - 20$

10. $f(x) = |x - 6|$

11. $f(x) = 6x + 12$

12. $f(x) = \dfrac{6}{x}$

13. $y = \dfrac{x}{2}$