CARNEGIE VANGUARD HS
Summer Assignment for students entering Pre-AP Geometry and/or Pre-AP Algebra 2

All of the questions below should be things you learned in Pre-AP Algebra 1. These are problems from old tests from Pre-AP Algebra 1 at Carnegie. You need to be comfortable with all of the concepts covered here. You should be able to complete all of these questions WITHOUT using a calculator.

1. Simplify $5(4^2-6^2)+3\left(7(-2)+18\div 6+(-5)^2\right)$

2. Evaluate $\left(\dfrac{4x^3-2y-2z^3}{4y^2-16x^2}\right)^3$ when $x=2$ and $y=-5$ and $z=3$.

3. Is $x=-4$ a solution to the equation $5x^2+10x-25\le 10$?

4. Evaluate $|xy+yz|-|xz|$ when $x=2$, $y=-4$, and $z=-7$.

5. Write an equation or inequality to represent "Five times the difference of a number *n* and forty-two is ten more than twice the product of a number *x* and a number *y*."

6. Write an equation or inequality to represent "The quotient of a number *w* and the sum of a number *a* and nine is at most twelve more than the opposite of *v*.

7. Simplify $10w^2(7w^3+4w^2-5w-9)-5w^3(6w^2-7w-4)$

8. Simplify $-4(5x-3y+10)+6(3x+7z+8)+\dfrac{2}{3}\left(15y-27z+\dfrac{21}{2}\right)$

9. Solve $8r-5(3r+7)=-21$ for *r*.

10. Solve $-\dfrac{3}{4}(8x-12)=5x-2$ for *x*.

11. Solve $\dfrac{3k}{2k-5}=\dfrac{7}{3}$ for *k*.

12. Solve $-10v+\dfrac{2}{5}z+6=-2$ for *z*.

13. Graph $3x+2y=18$. Give the *x*-intercept as a coordinate pair, the *y*-intercept as a coordinate pair, and the slope.

14. Graph $y=\dfrac{3}{4}x-6$. Give the *x*-intercept as a coordinate pair, the *y*-intercept as a coordinate pair, and the slope.

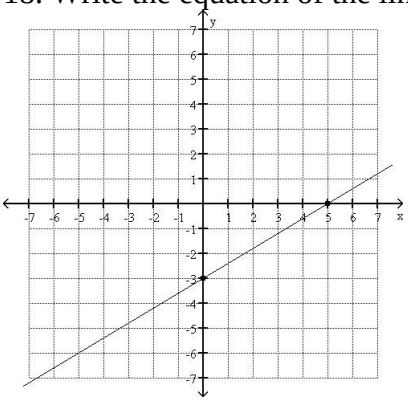
15. Which of the following lines are parallel to each other? Explain.

$y=-3x+10$ $\quad y=\dfrac{2}{5}x-8$ $\quad -5x+2y=-16$ $\quad 2x-5y=30$ $\quad 6x+2y=-10$

16. A line has a slope of $-\frac{2}{5}$ and passes through the point $(10,7)$. Write the equation of this line in point-slope form, slope-intercept form, and standard form.

17. A line passes through the points $(-2,3)$ and $(6,35)$. Write the equation of this line in point-slope form, slope-intercept form, and standard form.

18. Write the equation of the line below. Give your equation both in slope intercept form and in standard form.

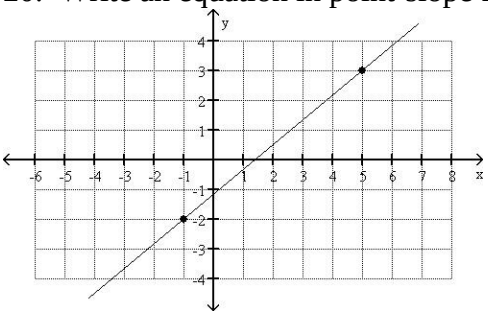


19. Line *k* has the equation $y = \frac{3}{4}x + 42$.

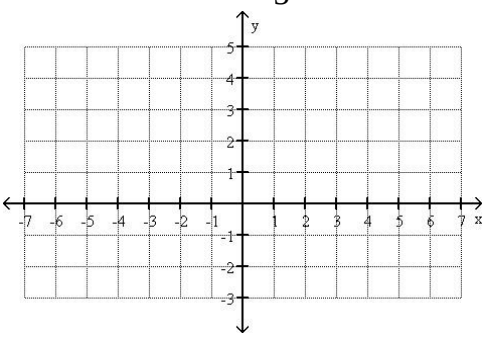
a. Write an equation of the line parallel to line *k* that passes through the point $(24,-15)$.

b. Write an equation of the line perpendicular to line *k* that passes through the point $(24,-15)$.

20. Write an equation in point-slope form for the line below. (you may use either of the marked points)



21. Graph $y - 4 = -\frac{3}{5}(x + 5)$ on the grid below.

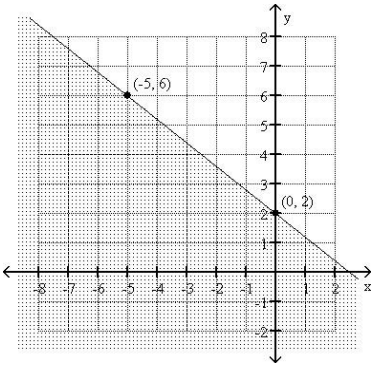


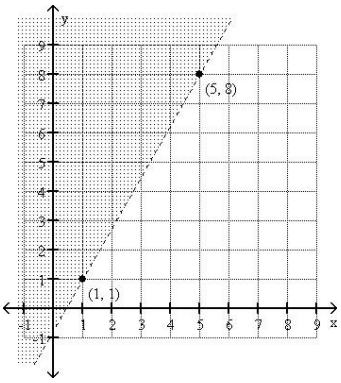
22. Solve $6(3x - 5) \le 2(9x + 7) + 10$. Graph your solution on a number line.

23. Graph $y < \frac{2}{3}x - 3$

24. Graph $4x - 7y \leq -28$

25. Write an inequality for each of the graphs below





26. Graph the following system of inequalities

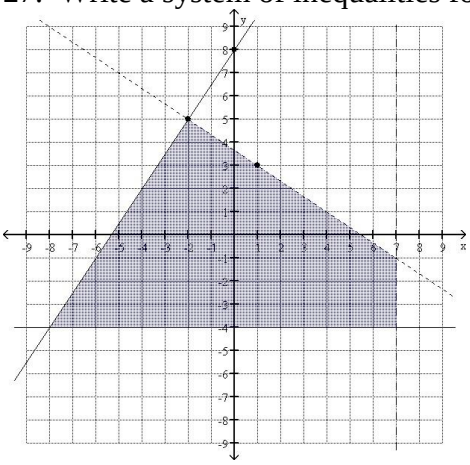
$x \geq -2$

$y < 5$

$2x - 3y \geq -6$

$2x + 5y > -20$

27. Write a system of inequalities for the shaded region.



28. Solve each of the following systems using substitution or elimination. **Give the solution and classify the system.**

$2x - 3y = 12$
$4x - 6y = -6$

$5x + 4y = 7$
$3x - 6y = 21$

$-\frac{2}{3}x + \frac{7}{3}y = -\frac{5}{3}$
$\frac{4}{5}x - \frac{14}{5}y = 2$

For questions 29-30, set up and solve a system of linear equations.

29. Evelyn is running a snack sale during lunch to raise money for charity. She is selling hot Cheetos with cheese for $1.50 each and chili-cheese fries for $2.50 each. At the end of the day she has raised $150 and sold 80 items. How many of each item did she sell?

30. Two families go to the movies. One family purchases two adult tickets and four youth tickets for $46. Another family purchases three adult tickets and five youth tickets for $62. How much would it cost to purchase six adult tickets and eight youth tickets?

31. For each of the following, find the product.

a. $(2x+3)(5x-4)$ b. $(x^2-3x+5)(2x^2+3x-7)$

32. Factor each of the following.

a. $x^2+7x-30$ b. $6x^2-11x+4$

c. $81x^2+180x+100$ d. $75x^6-27x^4$

33. For what value(s) of *k* are the following expressions perfect square trinomials?

a. $49x^2+kx+121$ b. $64x^2+80x+k$

34. Solve each of the following.

a. $x^2+15x=-50$ b. $6x^2-5=13x$

c. $-12x^3-44x^2-40x=0$ d. $2x^3+3x^2-8x-12=0$

35. Sketch the graph of $y=-\frac{1}{2}x^2+5$.

For questions 36-38, find the *y*-intercept, *x*-intercepts, and vertex; then sketch the graph.

36. $y=x^2+6x+5$ 37. $y=-2(x-5)^2+6$ 38. $y=2x^2+5x-25$

39. Solve $x^2-12x-13=0$ by completing the square.

40. Solve $3x^2+9x+5=0$ by using the quadratic formula.

41. Simplify each of the following using the properties of exponents. Your answers should not contain any negative exponents or more than one of any variable.

a. $(10r^4)^2\cdot 3r^5$ b. $(2x^4y^{-8}z^5)^5$ c. $\frac{2^5\cdot 4^4}{8^3}$

d. $\frac{22x^2y^{-6}}{(4x^{-5}y^{-1})^2}\cdot\frac{(5x^2y)^0}{y^5}$ e. $\left(\frac{m^3n^{10}}{5m^{11}n^7}\right)^{-3}$

42. Simplify each of the following:

a. $\sqrt{32}$ b. $2\sqrt{75}$ c. $3\sqrt{250}$

d. $\frac{\sqrt{40}}{\sqrt{630}}$ e. $\left(2\sqrt{300}\right)\left(5\sqrt{8}\right)-\left(2\sqrt{98}\right)\left(5\sqrt{48}\right)$

Supply Lists:

Algebra 2:

- A 100+ page graph paper spiral notebook
- A binder/folder to keep papers in
- Loose-leaf lined paper
- Loose-leaf graph paper
- Multiple pencils (NO PENS ALLOWED!)
- A box of tissues (class donation)