Algebra I Review
****You may use a calculator throughout the review – with the exception of Part A and Part B.**

Part A – Find the value of each expression below – No calculator!

1) $\left(-7\right)^2$ 2) -7^2 3) $4\frac{1}{8} \div -6\frac{3}{4}$ 4) $\frac{459+281}{287-37}$

5) $3\frac{2}{5} - 5\frac{1}{2}$ 6) $12 \div 2 - 5 \bullet 3$ 7) $12 - 5 + 6 - 2$ 8) $24 \div \left(-6\right) \bullet 4$

9) $-8 \bullet 3 - 12 \div 4$ 10) $\left(1+7\right)^2 - 2\left(8-15\right)^2$ 11) $\left(18 \div 2 + 1\right) - \left(15 - 10 \div 2\right)$

12) $\left|-5\right| - \left|-3\right|$ 13) $3 + 2\left[15 + 4\left(7 - 2^3\right)\right]$ 14) $-5\left[6^2 \div 4 + \left(13 - 5 \bullet 2\right)^2\right]$

Part B – Evaluate the following if x = 3, y = -2 and z = 5

1) 3z – x + y 2) $x^2 - y^2$ 3) xy^2 4) $\left(x+z\right)^2$

5) $z^2 - 5\left(-x - y\right)$ 6) $\frac{-3z+2x}{-5y}$ 7) $-y^2 - 2x^2 + z^2$

Part C – Simplify each expression below

1) 2x + 6x 2) 2x + 6y 3) 4x – 6x – 10x

4) $(2x)(3x)(-5)$ 5) $(8y)(6x)(2z)$ 6) $8+6x-10+3(2x+5)$

7) $8 + 9x + 10$ 8) $8 \bullet 9m \bullet (-10)$ 9) $-6(4-5y)-20y$

10) $\frac{8y-12}{4}$ 11) $18z-14-2z-22$ 12) $-3a^2+2b-3c^3+5a^2$

Part D - Use the distributive property to simplify each expression

1) $13(2x+10)$ 2) $-5(x-8)$ 3) $(5x+2)-2(3x+5)$

4) $15(2m-3n)$ 5) $2y-2(y+5)$ 6) $-11(2-y)$

7) $8y+6(4-5y)-15$ 8) $-2(2x+8)$ 9) $(2+3y)-(2-3y)$

10) $\frac{3}{4}(12x-20)-\frac{1}{2}x$ 11) $7(y+2)-3(2y-5)$ 12) $8y-4(6-2y)$

13) $8+4(3m-2)$ 14) $12-3(4a+2)-6$ 15) $8x-(5-3x)-6$

16) $-5(6y+2)-13y+(-3)^3$ 17) $6(2m+3)+4^2-6(2+3)^2$

Part E – Solve each equation

1) $-7 = 4 - (-x)$

2) $\frac{2}{5}x = -\frac{10}{13}$

3) $\frac{2}{3}x + 5 = 13$

4) $2x - 4(3 - x) = 18$

5) $-21x + 15 = -5x + 7$

6) $6(2 - x) + 4x = -5(x + 3)$

7) $2.07x + 14.75 = 4.21x - 5.091$

8) $2x - 5 + 11 = 2 - 3x + 9$

9) $-3(2x + 5) = -(15 - 6x)$

10) $-4y - (5y + 6) = -7y + 3$

11) $6x - 8 = -3(2x - 4)$

12) $5x + 3 - 2x = 3(x + 2)$

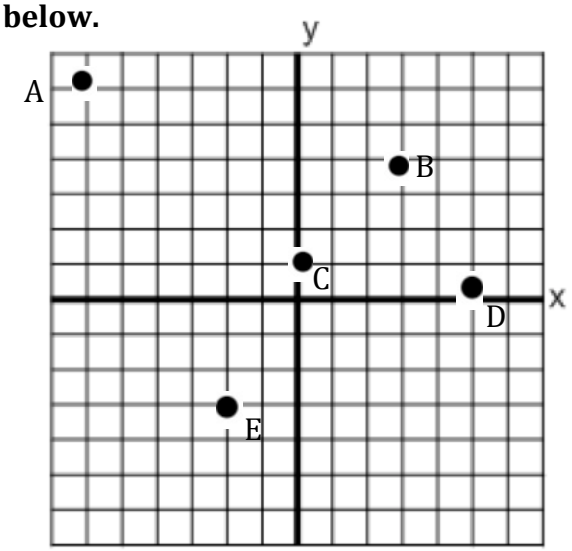
Part F – Solve for the indicated variable

1) 5a + b = c, solve for a

2) $-8pq = 4rs$, solve for p

3) $P = 2W + 2L$, solve for W

Part G Name the coordinates of the points graphed below.



A)

B)

C)

D)

E)

Consider the equation: $3x-2y=\frac{1}{2}(4x+6)$. **Complete the following ordered pairs.**

1) $\left(?,\frac{1}{4}\right)$ 2) $(3,?)$ 3) $\left(-\frac{2}{3},?\right)$

Identify the Slope and y-intercept of the following equations.

4) $y=\frac{1}{2}x+5$ 5) $4x+3y=15$

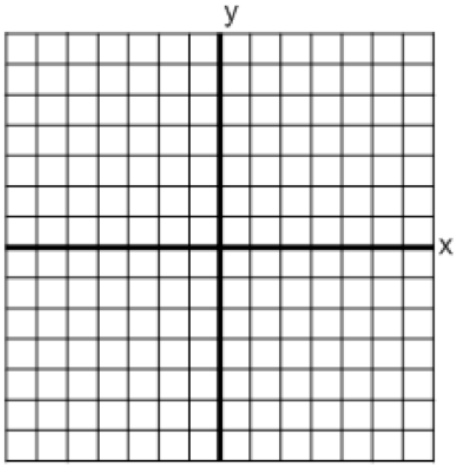
Find the slope between each pair of points.

6) $(-5,12)$ and $(7,3)$ 7) $(5,12)$ and $(5,-5)$

8) Find the value of x so that the slope between the points $(x,-2)$ and $(4,3)$ is $\frac{5}{6}$.

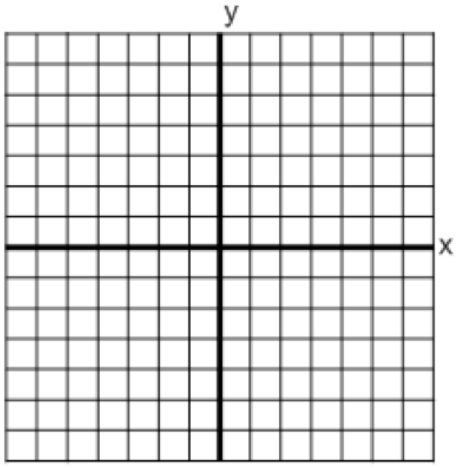
Graph the following equations using whichever method you choose.

9) $2x-3y=6$



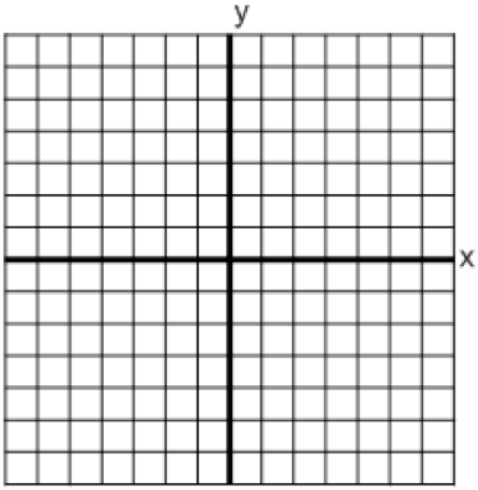
10) $2x-y=2x+3$

11) $2(x+3)=12$



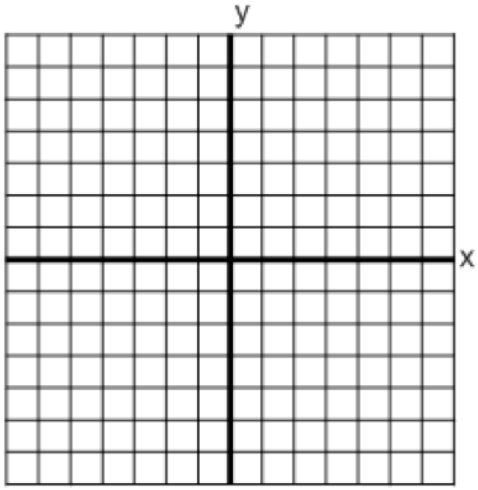
12) $y=4-3x$

13) $6y=3x-12$



14) $5x=2y+8$

15) $4y-4x=0$



16) $3(2y-3=-3)$

Part H
Write the equation of the lines in the form requested

In slope intercept form if :

1) m = 3 and b = -2

2) m = 1/6 and b = 6

3) m = 0 and b = -7

In Slope intercept form that is parallel to the given line and passes through the given point.

4) $y=-\frac{1}{4}x-1$ through $(4,1)$

5) $3x+y=9$ through $(3,-2)$

In Point-Slope form that is perpendicular to the given line and passes through the given point.

6) $y = 4x - 6$ and through $(-8,3)$

7) $3x - 2y = -8$ and through $(3,-4)$

Write the equation of the line through the 2 given points (any form is OK).

8) $(1,4)$ and $(5,7)$

9) $(-3,-3)$ and $(7,2)$

10) $(8,-2)$ and $(4,-2)$

Part I – Solve each inequality/equation below

1) $6y - 7 < -2y + 13$

2) $9 \le 6 - x \le 12$

3) $|2x + 1| \ge 5$

4) $4 + 2x \ge 1$ or $-5x > 25$

5) $|4x - 3| = 11$

6) $|3x + 1| - 4 = 13$

7) $|3x - 5| \ge 10$

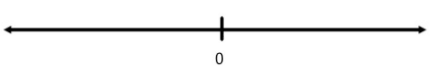
8) $|4 - 2x| - 7 < 12$

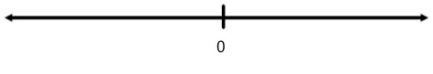
Graph the solutions on a number line.

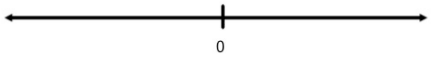
9) $x < 5$ or $x \ge 8$

10) $x \le 3$ or $x \ge 0$

11) $-10 \le x \le -5$

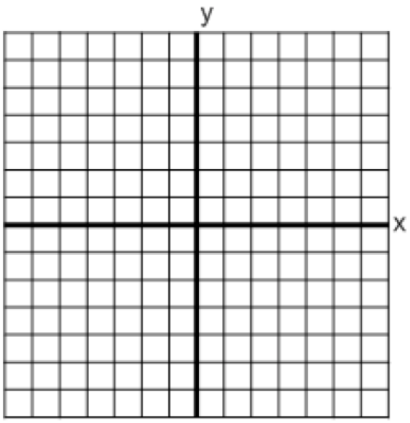




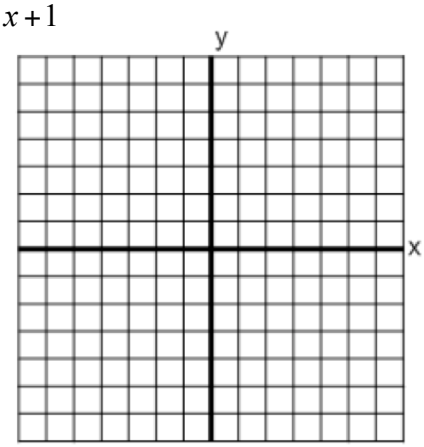


Graph the following inequalities on a coordinate plane.

12) $-2x - 3y < 12$



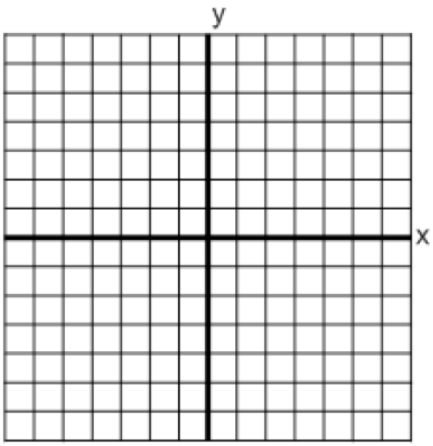
13) $y \geq \frac{2}{5}x + 1$



Part J Systems of Equations

Solve by graphing

1) $2x - y = 5$
$y = -3x + 5$



Solve by Substitution

2) $10x + y = 5$
$5x + 4y = 6$

Solve by linear Combinations (Elimination)

3) $6x - 4y = 9$
$8x + 3y = -13$

Solve by Any method (# 4-6)

4) $4x - y = 6$
$2x = \frac{1}{2}y + 3$

5) $\begin{aligned} 3y &= 7x - 1 \\ 2y - \frac{14}{3}x &= 5 \end{aligned}$

6) $\begin{aligned} \frac{1}{3}x &= \frac{1}{2}y - 16 \\ x + y &= 7 \end{aligned}$

7) You have a handful of 30 coins, all nickels and dimes. If you have a total of $2.00, how many of each coin do you have?

8) A rectangle has length that is 3 less than twice the width. Find the length and width of the rectangle if the perimeter is 48 cm.

9) The larger of two numbers is 4 more than 3 times the smaller. The sum of the 2 numbers is 28. Find the two numbers.

Part K Simplify the following expressions, leave no negative exponents in your answer.

1) $\left(3x^5\right)^2$ 2) $3\left(x^5\right)^2$ 3) $5\left(-xy^2\right)^3$ 4) $4x^{-2} \bullet -3x^5$

5) $4x^3y^4 \bullet -6x^5y$ 6) $\left(4x^3y^4\right)^3$ 7) $\left(\frac{15x^3}{12x^8}\right)^2$ 8) $\frac{18x^5y^{-3}}{12x^{-2}y^6}$

9) $\left(3x^2y^{-1}\right)\bullet\left(-5x^{-3}y^2\right)^4$ 10) $\left(\frac{-4x^{-3}}{3y^2}\right)^{-3}$ 11) $\frac{25x^{-1}y^2}{2x^3y^5}\bullet\frac{8x^{-5}}{10x^{-3}y^2}$ 12) $\frac{-4x^2}{y^{-3}}$

Part L Simplify each expression completely

1) $\left(8x^2+11\right)+\left(12x^2+x-10\right)$ 2) $\left(-2x^3+4x^2-4\right)-\left(5x^3+7x^2+x+6\right)$ 3) $\left(2x-6\right)-\left(2x-6\right)$

4) $\left(r-2\right)\left(3r+4\right)$ 5) $\left(2x-7\right)\left(3x+1\right)$ 6) $\left(6x-9\right)\left(x-2\right)$

7) $\left(2x+3\right)^2$ 8) $\left(2x+5\right)\left(7x^2-3x-4\right)$ 9) $\left(4x-3\right)\left(4x+3\right)$

Factor each expression completely

10) $5x^2y^3+30xy^4$ 11) x^2-7x-8 12) $4x^2+4x+1$

13) $x^2-6x-16$ 14) $16x^2-49$ 15) $2x^2-7x+3$

16) $24x^2 - 30$

17) $9x^2 + 16$

18) $7x^2 - 28$

19) $2x^3 + 2x^2 - 24x$

20) $3x^2 - 3x - 9$

21) $x^2 - 16x + 48$

Part M – Solve each equation by Factoring (# 1-4)

1) $3x^2 + 18x = 0$

2) $x^2 + 2x - 24 = 0$

3) $3x^2 + 8x - 4 = 12$

4) $36x^2 - 9 = 0$

Solve using the quadratic formula – you may either simplify the radical or round to the nearest hundredth

5) $5x^2 + 2x - 1 = 0$

6) $3x^2 + 7x + 2 = 0$

Part N – Simplify each radical – (no decimals!)

1) $\sqrt{25}$ 2) $\sqrt{52}$ 3) $\left(6\sqrt{8}\right)\left(7\sqrt{2}\right)$

4) $\left(-2\sqrt{6}\right)\left(7\sqrt{30}\right)$ 5) $4\sqrt{3}-6\sqrt{3}$ 6) $4\sqrt{8}+5\sqrt{2}$

7) $5\sqrt{\frac{11}{16}}$ 8) $\frac{4\sqrt{3}}{\sqrt{2}}$ 9) $5\sqrt{40}$

10) $\frac{2\sqrt{3}}{\sqrt{6}}$ 11) $\frac{8+\sqrt{8}}{2}$ 12) $\left(4\sqrt{3}\right)^2$

Answers

Part A

1) 49 2) – 49 3) – 11/18 4) 74/25 5) -21/10 6) -9 7) 11 8) -16
9) -27 10) -34 11) 0 12) 2 13) 25 14) -90

Part B

1) 10 2) 5 3) 12 4) 64 5) 30 6) -9/10 7) 3

Part C

1) 8x 2) already simplified 3) -12x 4) $-30x^2$ 5) 96xyz
6) 12x + 13 7) 9x + 18 8) -720m 9) 10y – 24 10) 2y – 3
11) 16z – 36 12) $-3c^3 + 2a^2 + 2b$

Part D

1) 26x + 130 2) -5x + 40 3) - x – 8 4) 30m – 45n 5) -10
6) 11y – 22 7) -22y + 9 8) - 4x – 16 9) 6y 10) 8.5x – 15
11) y + 29 12) 16y – 24 13) 12m 14) -12a 15) 11x – 11
16) -43y – 37 17) 12m – 116

Part E

1) x = 11 2) x = - 25/13 3) x = 12 4) x = 5 5) x = 1/2
6) x = - 9 7) x = 9.27.... 8) x = 1 9) x = 0 10) y = - 9/2
11) x = 5/3 12) no solution

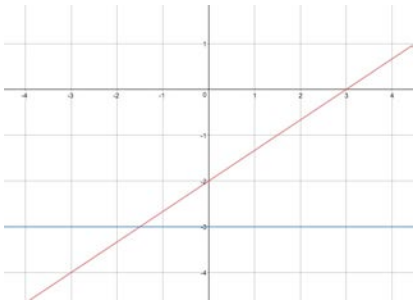
Part F

1) a = (c – b)/5 2) p = -rs/2q 3) W = (P – 2L)/2

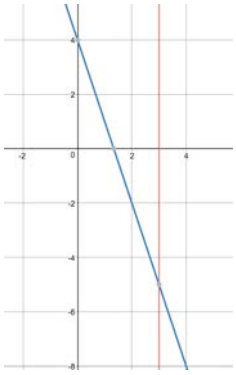
Part G

A) (-6,6) B) (3,4) C) (0,1) D) (5,0) E) (-2,-3)
1. x = 3.5 2) y = 0 3) y = - 11/6 4) m = 1/2, b = 5 5) m = 4/3, b = 5
6) m = -3/4 7) m = undefined 8) x = -2

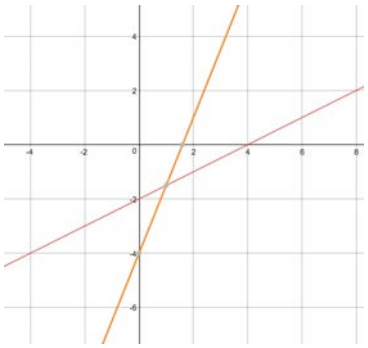
9 and 10



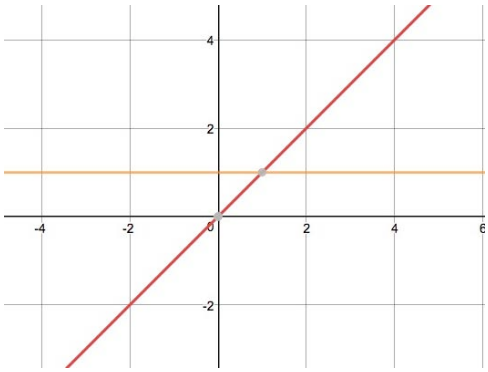
11 and 12



13 and 14



15 and 16



Part H

1) y = 3x – 2 2) $y=\frac{1}{6}x+6$ 3) y = - 7 4) $y=-\frac{1}{4}x+2$ 5) y = -3x + 7

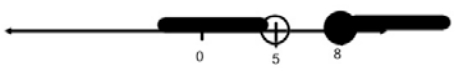
6) $y-3=-\frac{1}{4}(x+8)$ 7) $y+4=-\frac{2}{3}(x-3)$ 8) $y-4=\frac{3}{4}(x-1)$ or $y-7=\frac{3}{4}(x-5)$ or $y=\frac{3}{4}x+\frac{13}{4}$

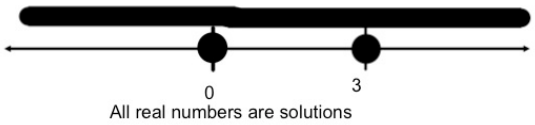
9) $y+3=\frac{1}{2}(x+3)$ or $y-2=\frac{1}{2}(x-7)$ or $y=\frac{1}{2}x-\frac{3}{2}$ 10) y = - 2

Part I

1) $y<\frac{5}{2}$ 2) $-3\geq x\geq -6$ 3) $x\geq 2$ or $x\leq -3$ 4) $x\geq -\frac{3}{2}$ or $x<-5$

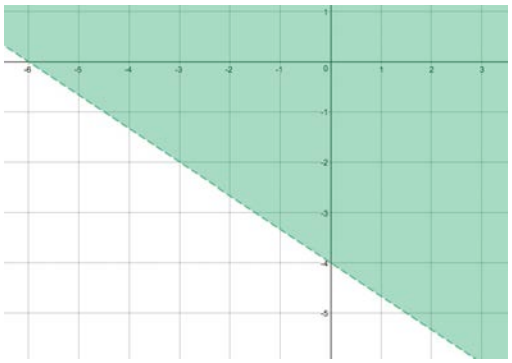
5) x = 3.5 or x = - 1 6) x = 16/3 or x = -6 7) $x\geq 5$ or $x\leq -\frac{5}{3}$ 8) $x>-\frac{15}{2}$ and $x<\frac{23}{2}$

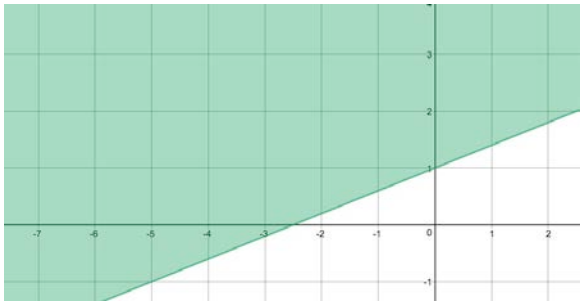
9) 

10) 

All real numbers are solutions

11) 

12) 

13) 

Part J

1) (0,5) 2) (2/5, 1) 3) (-1/2, -3) 4) Infinite number of solutions 5) No solutions
6) (-15,22) 7) 10 dimes, 20 nickels 8) Length = 15, Width = 9 9) Small = 6, Large = 22

Part K

1) $9x^{10}$ 2) $3x^{10}$ 3) $-5x^3y^6$ 4) $-12x^3$ 5) $-24x^8y^5$

6) $64x^9y^{12}$ 7) $\frac{25}{16x^{10}}$ 8) $\frac{3x^7}{2y^9}$ 9) $\frac{1875y^7}{x^{10}}$

10) $\frac{27x^9y^6}{-64}$ 11) $\frac{10}{x^6y^5}$ 12) $-4x^2y^3$

Part L

1) $20x^2+x+1$ 2) $-7x^3-3x^2-x-10$ 3) 0 4) $3r^2-2r-8$ 5) $6x^2-19x-7$

6) $6x^2-21x+18$ 7) $4x^2+12x+9$ 8) $14x^3+29x^2-23x-20$ 9) $16x^2-9$

10) $5xy^3\left(x+6y\right)$ 11) $\left(x-8\right)\left(x+1\right)$ 12) (2x + 1)(2x + 1) 13) (x – 8)(x + 2)

14) (4x + 7)(4x – 7) 15) (2x - 1)(x – 3) 16) $6\left(4x^2-5\right)$ 17) does not factor 18) 7(x +2)(x – 2) 19) 2x(x + 4)(x – 3) 20) $3(x^2 – x – 3)$ 21) (x – 12)(x -4)

Part M

1) x = 0,-6 2) x = -6, 4 3) x = 4/3, -4 4) x = 1/2, - 1/2

5) $x=\frac{-1\pm\sqrt{6}}{5}$ or x = 0.29, -0.69 6) x = -1/3, -2

Part N

1) 5 2) $2\sqrt{13}$ 3) 168 4) $-84\sqrt{5}$ 5) $-2\sqrt{3}$

6) $13\sqrt{2}$ 7) $\frac{5\sqrt{11}}{4}$ 8) $2\sqrt{6}$ 9) $10\sqrt{10}$ 10) $\sqrt{2}$ 11) $4+\sqrt{2}$

12) 48