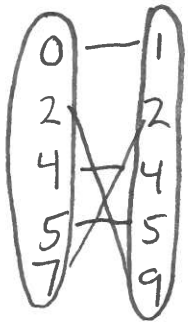
Math 10 Practice Final Exam ~~Part 1~~

Name: Key

1. Given: $\{(0,1),(4,4),(2,9),(7,2),(5,5)\}$



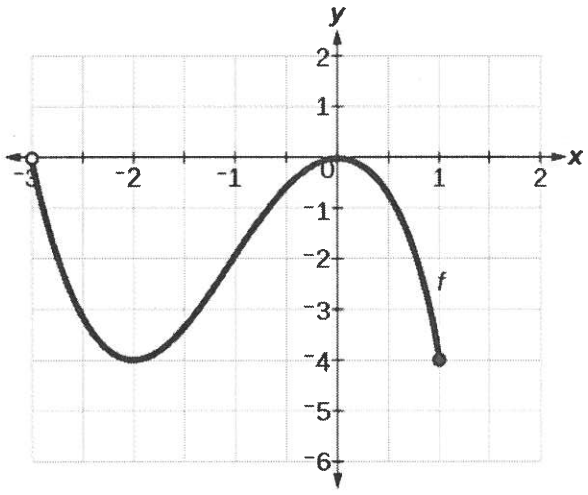
Domain:
$\{0,2,4,5,7\}$
Range:
$\{1,2,4,5,9\}$
Is this a Function?
Yes

2. Evaluate $f(a)=a^3-4$ find $f(-2)$ $= (-2)^3-4$

$= -8-4$

$= -12$

3.



Domain: $(-3,1]$ or $-3 < x \leq 1$

Range: $[-4,0]$ or $-4 \leq y \leq 0$

Is this a Function? yes

4. Evaluate $m(v)=v+3$ find $m(4v-3)$ $= (4v-3)+3$

$m(4v-3) = 4v$

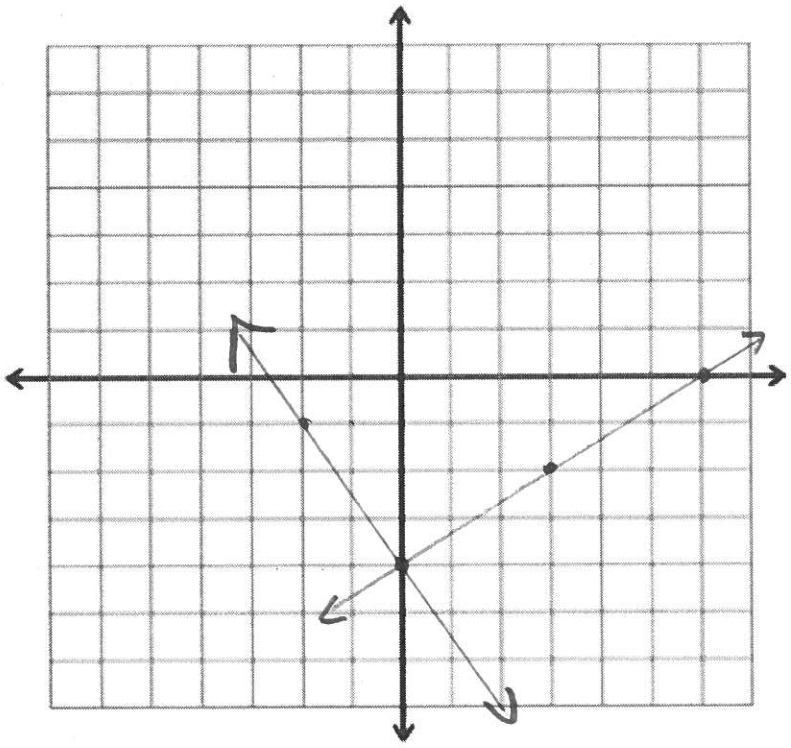
5. Are these lines Parallel, Perpendicular or neither?

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

$y=\frac{4}{3}x+3$

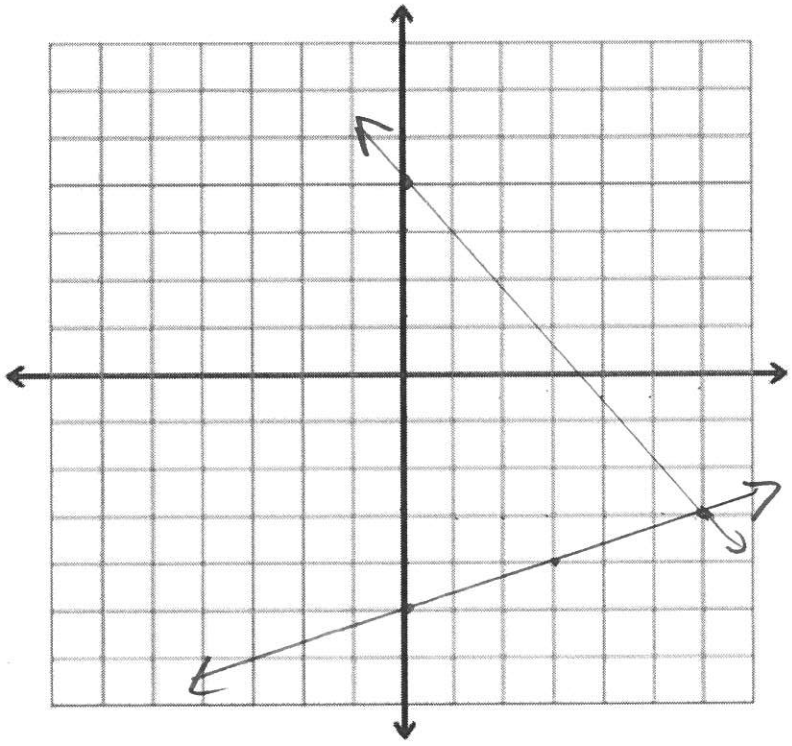
Perpendicular

6. Graph $y=\frac{2}{3}x-4$ and draw a perpendicular line through $(0,-4)$



7. solve by graphing $y=\frac{1}{3}x-5$

$y=-\frac{7}{6}x+4$



(6, -3)

8. Write the equation of a line passing through $(2,3)$ and $(4,2)$ in STANDARD form $(Ax+By=C)$

$m=\frac{2-3}{4-2}$

$=\frac{-1}{2}$

$3=-\frac{1}{2}(2)+b$

$3=-1+b$

$+1 \quad +1$

$4=b$

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

$+\frac{1}{2}x \quad +\frac{1}{2}x$

$2\left(\frac{1}{2}x+y\right)=2(4)$

$x+2y=8$

9. Write the equation of a line in slope intercept form $(y=mx+b)$ passing through $(-2,-1)$ and parallel to $y=-3x-5$

$y=mx+b \quad m_{\parallel}=-3 \quad (x,y)=(-2,-1)$

$-1=-3(-2)+b$

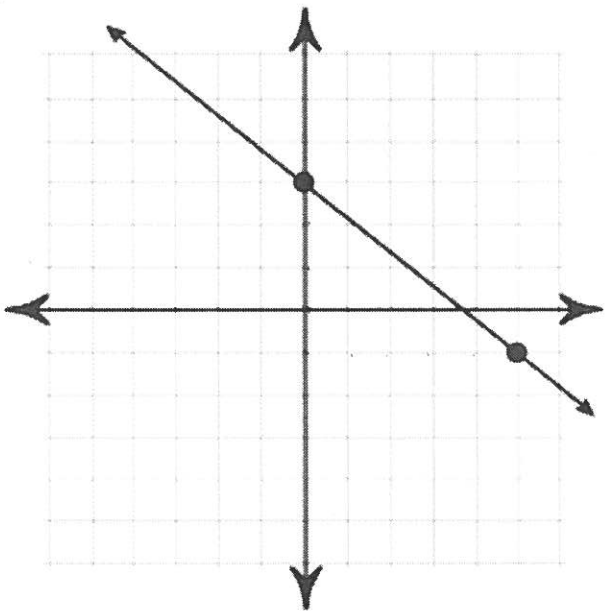
$-1=6+b$

$-6 \quad -6$

$-7=b$

$y=-3x-7$

10. Write the equation of this line in slope intercept form $(y=mx+b)$



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

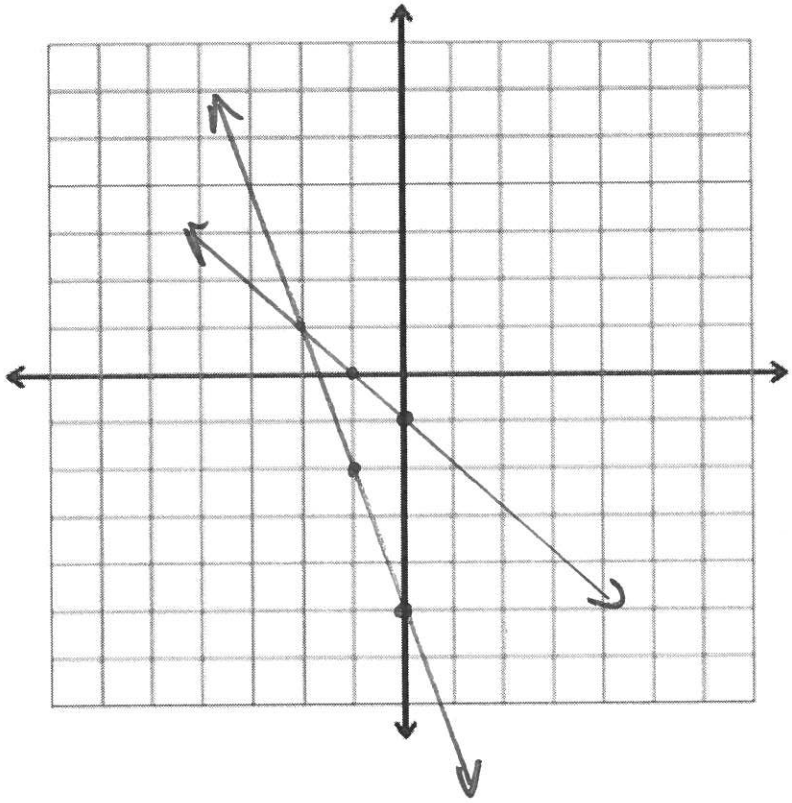
11. Solve by graphing:

$3x + y = -5$

$x + y = -1$

$y = -3x - 5$

$y = -x - 1$



$(-2, 1)$

12. Solve by substitution

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

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

$\frac{3}{2}(x+4)+6=-\frac{2}{3}(x-5)+13$

$-6 \qquad -6$

$\frac{3}{2}(x+4)=-\frac{2}{3}(x-5)+7$

$\frac{3}{2}x+6=-\frac{2}{3}x+\frac{10}{3}+7$

$-6 \qquad -6$

$\frac{3}{2}x=-\frac{2}{3}x+\frac{13}{3}$

$+\frac{2}{3}x \qquad +\frac{2}{3}x$

$6\left(\frac{13}{6}x\right)=\left(\frac{13}{3}\right)6$

$\frac{13x}{13}=\frac{26}{13}$

$x=2$

$y=\frac{3}{2}(x+4)+6$ and $x=2$

$y=\frac{3}{2}(2+4)+6$

$y=\frac{3}{2}(6)+6$

$y=9+6$

$y=15$

(2, 15)

13. Solve by elimination

$3x-5y=3$

$4x+7y=4$

$21x-35y=21$

$20x+35y=20$

$\frac{41x}{41}=\frac{41}{41}$

$x=1$

$3(1)-5y=3$

$-3 \qquad -3$

$-5y=0$

$\frac{-5y}{-5}=\frac{0}{-5}$

$y=0$

(1, 0)

14. Write the equation of both lines passing through the following points then solve by elimination.

Line 1: $\left(-\frac{8}{5},4\right)$ and $\left(-\frac{6}{5},6\right)$

$m = \frac{6-4}{-\frac{6}{5}--\frac{8}{5}}$

$= \frac{2}{\frac{2}{5}}$

$= 2 \cdot \frac{5}{2}$

$= 5$

$y = mx + b \quad m = 5 \quad (x,y) = \left(-\frac{8}{5},4\right)$

$4 = 5\left(-\frac{8}{5}\right) + b$

$4 = -8 + b$

$+8 \quad +8$

$12 = b$

$y = 5x + 12$

Line 2: $\left(\frac{2}{5},\frac{4}{5}\right)$ and $\left(\frac{4}{5},\frac{18}{5}\right)$

$m = \frac{\frac{18}{5} - \frac{4}{5}}{\frac{4}{5} - \frac{2}{5}}$

$= \frac{\frac{14}{5}}{\frac{2}{5}}$

$= \frac{14}{5} \cdot \frac{5}{2}$

$= 7$

$\frac{4}{5} = 7\left(\frac{2}{5}\right) + b$

$\frac{4}{5} = \frac{14}{5} + b$

$-\frac{14}{5} \quad -\frac{14}{5}$

$-\frac{10}{5} = b$

$-2 = b$

$y = 7x - 2$

$y = 5x + 12$

$-y = -7x + 2$

$0 = -2x + 14$

$+2x \quad +2x$

$\frac{2x}{2} = \frac{14}{2}$

$x = 7$

$y = 7x - 2, \quad x = 7$

$y = 7(7) - 2$

$y = 49 - 2$

$y = 47$

$(7, 47)$

15. a) Solve by substitution $y=-\frac{1}{2}x-4$

$y=x-1$

$-\frac{1}{2}x-4=x-1$

$-x \quad -x$

$-\frac{3}{2}x-4=-1$

$+4 \quad +4$

$2\left(-\frac{3}{2}x\right)=(3)2$

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

$y=x-1$ and $x=-2$

$y=-2-1$

$y=-3$

$(-2,-3)$

b) solve by elimination $2x+y=-2$

$-6x+2y=26$

$2x+y=-2$

$-6x+2y=26$

$\times 3 \Rightarrow 6x+3y=-6$

$-6x+2y=26$

$\frac{5y}{5}=\frac{20}{5}$

$y=4$

$2x+y=-2$ and $y=4$

$2x+4=-2$

$-4 \quad -4$

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

$(-3,4)$

c) use the answers (points) from parts a & b to find the equation of a line in STANDARD form $(Ax+By=C)$

$m=\frac{4--3}{-3--2}$

$=\frac{7}{-1}$

$=-7$

$y=mx+b$

$-3=-7(-2)+b$

$-3=14+b$

$-14 \quad -14$

$-17=b$

$y=-7x-17$

$+7x \quad +7x$

$7x+y=-17$

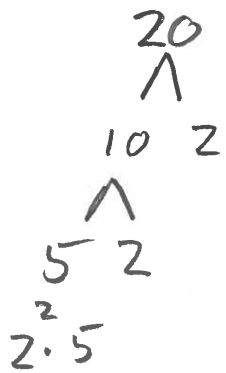
Name:

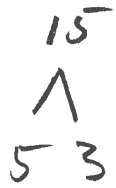
16 Simplify using only POSITIVE exponents $\left(2a^3b^2c^{-4}\right)^5$

$2^5 a^{15} b^{10} c^{-20}$

$\frac{32a^{15}b^{10}}{c^{20}}$

17 ~~2~~. Find the Least Common Multiple (LCM) of 20 and 15





$3 \cdot 5$

$LCM = 2^2 \cdot 3 \cdot 5$

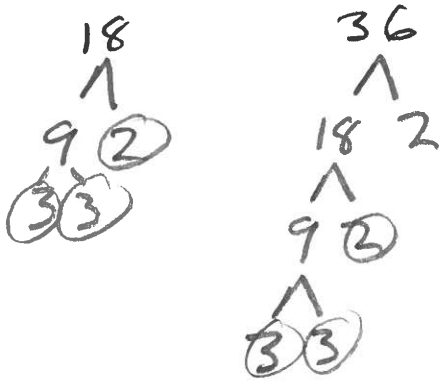
$= 60$

18 ~~3~~. Simplify using only POSITIVE exponents $\frac{\left(5xy^2\right)\left(6xy^3\right)}{\left(10xy^2\right)^2}$

$\frac{30x^2y^5}{100x^2y^4}$

$\frac{3y}{10}$

19 A. Find the Greatest Common Factor (GCF) of 18 and 36



$GCF = 3 \cdot 3 \cdot 2$
$= 18$

20 B. Simplify using only POSITIVE exponents $\left(\frac{x^4y^2}{\left(x^7y^2\right)\left(x^{-4}y^0\right)^3}\right)^{-3}$

$\left(\frac{x^4y^2}{x^7y^2x^{-12}y^0}\right)^{-3} = \left(\frac{x^4y^2}{x^{-5}y^2}\right)^{-3}$

$= (x^9)^{-3}$

$= x^{-27}$

$= \frac{1}{x^{27}}$

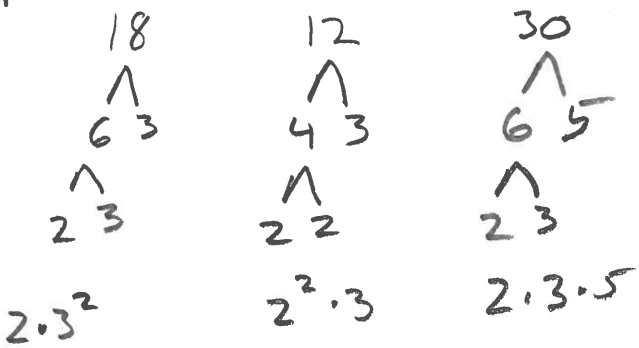
21 B. Simplify using only POSITIVE exponents $\frac{\left(-2x^4y^2\right)(x)}{x^{-2}y^4}$

$= \frac{-2x^5y^2}{x^{-2}y^4}$

$= -2x^7y^{-2}$

$= \frac{-2x^7}{y^2}$

27. Find the Least Common Multiple (LCM) of $18x^3y, 12x^3y^2$ and $30x^2y$



$LCM = 2^2 \cdot 3^2 \cdot 5 x^3 y^2$

$= 180 x^3 y^2$

28. Simplify using only POSITIVE exponents and find the Greatest Common Factor (GCF)

$(9x^2y)^2(4x^2y^2)^3$

$9^2 \cdot 4^3 x^4 y^2 x^6 y^6$

$3^4 \cdot 2^6 x^{10} y^8$

$(9xy^{-1})^2(2x^2)^4(y^2)^2$

$9^2 x^2 y^{-2} 2^4 x^8 y^4$

$3^4 \cdot 2^4 x^{10} y^2$

$GCF = 3^4 \cdot 2^4 x^{10} y^2$

$= 1296 x^{10} y^2$

24. Solve for x:

$5^{x+2} = \left(\frac{1}{25}\right)^{x-1}$

$5^{x+2} = (5^{-2})^{x-1}$

$5^{-x+2} = 5^{-2x+2}$

$-x+2 = -2x+2$

$-2 \quad -2$

$x = -2x$

$x = -2x$

$+2x \quad +2x$

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

$x = 0$

25 ~~10~~. Simplify: $(5x^2-7x+4)-(4x^2-7x+4)$

x^2

26 ~~11~~. Expand (multiply): $\frac{1}{7}x(14x-7)$

$\frac{14x^2}{7} - \frac{7}{7}x$

$2x^2 - x$

27 ~~12~~. Expand (multiply): $(x-4)(4x-1)$

$4x^2 - x - 16x + 4$

$4x^2 - 17x + 4$

28 ~~13~~. Factor: $21x^5 - 28x$

$7x(3x^4 - 4)$

29 ~~14~~. Factor: $x^2 - 4x - 21$

$x^2 - 7x + 3x - 21$

$x(x-7) + 3(x-7)$

$(x-7)(x+3)$

30 ~~15~~. Factor: x^2-64

$(x+8)(x-8)$

31 ~~16~~. Factor: $10x^2-4x-15x+6$

$2x(5x-2)-3(5x-2)$

$(5x-2)(2x-3)$

32 ~~17~~. Simply: $\left(\frac{1}{3}x-4\right)-\left(\frac{3}{4}x+3\right)$

$\frac{4}{12}x-\frac{9}{12}x-4-3$

$-\frac{5}{12}x-7$

33 ~~18~~. Expand (multiply): $(2x-1)(-x^2+3x+7)$

$=-2x^3+6x^2+14x$

$+x^2-3x-7$

$-2x^3+7x^2+11x-7$

34 ~~19~~. Factor: $x^4 - 625$

$(x^2 - 25)(x^2 + 25)$

$(x-5)(x+5)(x^2+25)$

35 ~~20~~. Factor: $7x^2 - 49x + 84$

$7(x^2 - 7x + 12)$

$7(x^2 - 4x - 3x + 12)$

$7(x(x-4) - 3(x-4))$

$7(x-4)(x-3)$

36 ~~21~~. Simplify then Factor: $(5x^4 + 3x^3 - 140x^2 - 45) - (3x^3 - 40x^2 - 5x^4 - 135)$

$10x^4 - 100x^2 + 90$

$10(x^4 - 10x^2 + 9)$

$10(x^4 - 9x^2 - x^2 + 9)$

$10(x^2(x^2 - 9) - 1(x^2 - 9))$

$10(x^2 - 9)(x^2 - 1)$

$10(x+3)(x-3)(x+1)(x-1)$

37. ~~22.~~ Simplify then graph: $\frac{\left(3^3x^5y^0\right)\left(3^{-3}x^{-3}y^{-6}\right)}{\left(2^{-2}xy^{-2}\right)\left(y^{-4}\right)}-\frac{\left(9xy^4\right)^2\left(x^2y\right)^2}{\left(x^3y^9\right)\left(3x\right)^3}=-\frac{3\left(x^0y^4\right)^2\left(-x\right)^{-1}\left(y^5\right)}{\left(x^6y^6\right)\left(y^7\right)\left(x^{-7}\right)}$

$4x - 3y = -3$

$-4x \qquad -4x$

$\frac{-3y}{-3} = \frac{-4x - 3}{-3}$

$y = \frac{4}{3}x + 1$