**General Math Revision Questions - Functions**

**Part 1 – Linear Modeling**

1. Algebraic Modeling
   1. Using your best judgment draw a “line of best fit” on the graph. (1)
   2. Determine two points on your “line of best fit” and use those points to work out the equation of your best fit line. (The equation is in the form of y = mx+c where m is the gradient and c is the y-intercept). (3)
   3. What does interpolate mean? (1)
   4. From your equation interpolate the value of y when x = 5. (1)
   5. What does extrapolate mean? (1)
   6. From your equation extrapolate the value of x when y = 50 (1)

**Part 2 – Graphing Equations**

**Graph by finding x-intercept and the y-intercept**

1) y - 2x = 6 2) 3x - y = 3 3) 2x = -3y + 6

**Graph the following by finding y-intercept and the slope (rise and run)**

**3)** y = 6x + 3 **4)**  ** + 6 = y 5)** y = 5 - ¾ x

**Part 3 – Finding the Equation of a Line**

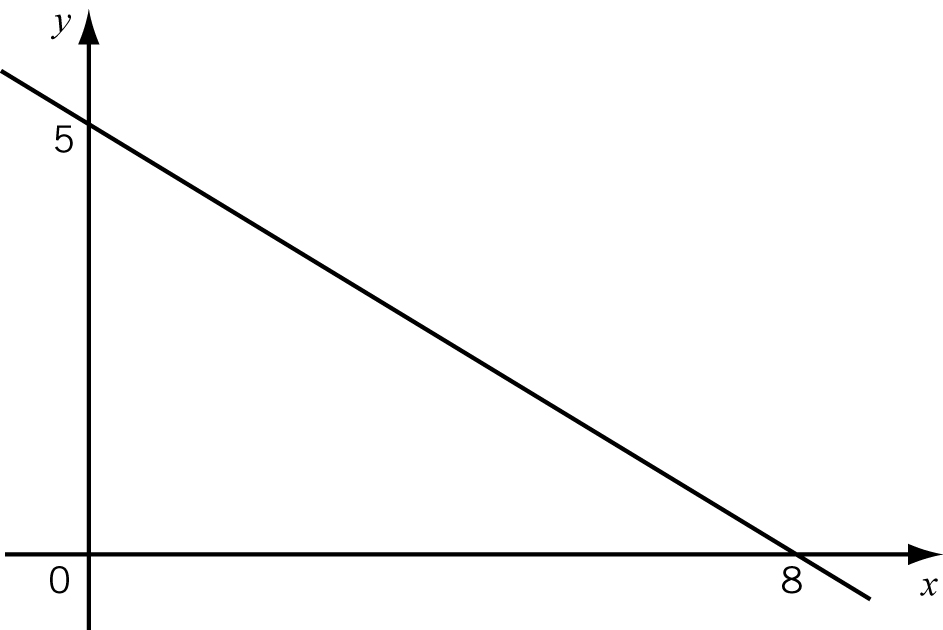
**For Questions 1 and 2 use the two coordinate points to find the equation of the line (y = mx + c) where gradient is m and y-intercept is c. (Leave the gradient as a fraction for both questions)**

1. (3, 8) and (4,-10) **2.)** (2, 7) and (4, 12)

**3.)** Using the equation you found in question 1. If x = -8, what is the value of y?

**4.)** Graph the equation found in question 2.

**5.)** Find the Equation of the line below.

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Part 4 – Creating formulae and Solving

**Write an equation to describe the information below and then solve the equation.**

1. A number (x) is multiplied by seven and then four is added to the result to give an answer of eighteen.
2. Two is added to a number (x) and the result is divided by four to give an answer of seven.

**Interpret and write the equations for question 6 to 7 then solve.**

1. Soren has set up a face-painting stand at the school fete. The paints cost Soren $52. If he charges $4 per child, how many faces does he need to paint to make a profit of $100?
2. A taxi meter charges passengers a flag call of $3.50, plus $1.75 a km. If a passenger only had $20, to the nearest km, the maximum distance they could travel would be?
3. Oliver has $4.95. He buys a seven newspaper and has $.75 left. If *x* represents the cost of the newspaper in cents, how many is each newspaper?

**PART 5 - Inequalities**

Shade non-required region on a Cartesian plane.

1. x ≤ 3 2.) y > 7 3.) -2 ≤ x < 6 4) -1 < x ≤ 0

Solve for x.

4.) 3x + 6 < 42 5.) 5x – 20 ≥ 40 6.)  + 7 ≤ 2*x* – 15

Sketch the graphs of the following half planes and shade the region needed.

1. y ≤ 2x – 1 8) 2x - y < 6

**Part 6 -** **Simultaneous Equations**

1. Graph the following equations to find the intersection of y = x + 3 and 3x + 2y = 6
2. The following simultaneous equations 2*x* + 5*y* = 14 and 10*y –* 4*x* = 52 have solutions at the which coordinates?
3. Jasmine bought 4 peaches and 2 kiwi fruit for $2.50, Dashiell bought 7 peaches and 1 kiwi fruit for $3.50. How much did each piece of fruit cost?
4. Two young witches had just graduated from the Hogwats Academy of Magic Craft. Lillian had attained 250 points of magic points upon graduation and achieved the ability to harness 25 points per day. Kathryn due to family commitments and a distracted school life was only able to graduate with 50 points of magic but due to her natural abilities and dragon bloodline she can accumulate 50 points of magic per day. After graduation Lillian feeling cocky challenges Kathryn. Kathryn being a noble soul accepts her challenge up but wants only enough time to accumulate enough magic to be exactly on par with Kathryn.
5. When should Kathryn set the final date?
6. How much magic will they both have by then?
7. Sketch 2x + y < 4 and 3x – y ≥ - 6 and shade the feasible region required.

**Part 7 - Break Point**

Young James Tucker wants to get into the business of selling samurai swords. He finds two blacksmiths companies in the yellow pages, “Swords R US” and “Deadly Blades of Immeasurable Furiness Co”. He calls them both and gathers the manufacturing information of each company.

Swords R US can manufacture samurai swords at $55 per sword with an upfront setup fee of $2000.

Deadly Blades of Immeasurable Furiness Co can manufacture samurai swords at $40 with the upfront setup fee of $4500.

Now young Mr. Tucker plans to sell the swords later for $70 a pop.

1. Find the Break Even dollar amount of Swords R US and Deadly Blades separately.
2. How long will it take for James to break even for each of these companies? Which company will be quicker to break even?
3. Which company would you recommend to James and under what reason?

**Part 8 - Linear Programming**

Big Boy and P-Buzy are two phat wRappers of the 21st Century. They travel throughout the states daily to sell some funky-as Wrap paper. They have two types up for grabs “BB-Wrap” and “P-Wrap”.

Big Boy knows that he needs to hold at least 200 “BB-Wrap”.

P-Buzy only requires a maximum of 450 “P-Wrap”.

Between the two they can only hold a maximum of 1000.

They can sell “BB-Wrap” for a profit of $15 each and the “P-wrap” for $10 profit.

Their job is to find out the best amount of wraps to stock that would maximize their profit.

1. Determine which items is x and which is y.
2. Set up all linear inequality constraints equations.
3. Draw the linear inequality equations and shade the “non-required” region.
4. Find all intersecting boundary points.
5. Set up the Profit Equation.
6. Which intersecting boundary point will maximize profit?