MATH 100 Solutions: QUIZ VI 18 October 2018

1. *[4 pts]* Consider the line L given by the equation y = −3 + 0.2x

Find the slope and both intercepts of L.

*Solution: If we write the line in the form y = mx + b, we find that m, the slope, is 0.2 and the y-intercept is -3. To find the x-intercept, set y = 0 in the equation y = -3 + 0.2x. So 0 = -3 + 0.2 x, from which it follows that x = 15.*

***Answers:*** *Slope = 0.2*

*x-intercept = 15*

*y-intercept = -3*

1. *[4 pts]* Find an equation for the line that is *perpendicular* to the line y = −13 + $\frac{1}{3}$ x and passes through the point C = (4, −2).

*Solution: Since the slope of the given line is 1/3, the slope of a perpendicular curve is -3.*

*Thus, using point slope form, y – (-2) = -3(x – 4), or equivalently:* ***y + 2 = - 3(x – 4)***

1. *[4 pts]* Write an equation of the line that has x-intercept equal to 5 and y-intercept equal to -7.

*Solution: Basically we are given that P = (5, 0) and Q = (0, -7) are points on the line.*

*Thus* $m=\frac{∆y}{∆x}=\frac{-7-0}{0-5}=\frac{7}{5}$

*Using point-slope form:*

$$y=\frac{7}{5}x-7$$

1. *[4 pts]* Write an equation of the line that is *parallel* to 4x – 3y = 1789 and passes through the point P = (3, 4).

*Solution: Writing the given line in slope-intercept form:*

$$y=\frac{4}{3}x-\frac{1789}{3}$$

*So we see that the slope of the given line is m=* $\frac{4}{3}$*.*

*Writing the parallel line in point-slope form:* $y-4=\frac{4}{3}(x-3)$ ***or, equivalently,*** $y=\frac{4}{3}x$

1. *[1 pt]* Which (if any) of the following relations are actually functions? List all of those relations given below that are actually functions. (Note: there may be none, exactly one, or more than one.)



 **ANSWER:** Only W is a function

1. *[1 pt]* Which (if any) of the following relations are actually functions? List all of those relations given below that are actually functions. (Note: possibly none, possibly only 1, possibly 2, …)



**ANSWER:** Only Z is a function

1. *[1 pt]* Which (if any) of the following relations are actually functions? List all of those relations given below that are actually functions. (Note: possibly none, possibly only 1, possibly 2, …)



**ANSWER:** Only Y is a function

1. *[1 pt]* Which (if any) of the following graphs represent functions? List all of the graph given below that are actually functions. (Note: possibly none, possibly only 1, possibly 2, …)



**ANSWERS:** W, X, and Y are functions

**Extra Credit** *[4 pts]*

The following curve is actually a straight line “in disguise.” Find its slope.

2(1– x) + 3(x + 5(x – 2)) = (x + 1)2 – (x + x2) + 1 + y

*Solution:*

*Simplifying the left-hand side:*

*2(1– x) + 3(x + 5x – 10) = (x + 1)2 – (x + x2) + 1 + y*

*2(1– x) + 3(6x – 10) = (x + 1)2 – (x + x2) + 1 + y*

*2 – 2x + 18x – 30 = (x + 1)2 – (x + x2) + 1 + y*

*2 – 2x + 18x – 30 = (x + 1)2 – (x + x2) + 1 + y*

*16 x – 28 = (x + 1)2 – (x + x2) + 1 + y*

*Expanding (x + 1)2 :*

*16 x – 28 = x2 + 2x + 1 – (x + x2) + 1 + y*

*Simplifying the right-hand side:*

*16 x – 28 = x2 + 2x + 1 – x – x2 + 1 + y*

*16 x – 28 = x + 2 + y*

*Solving for y:*

*15 x – 30 = y*

*y = 15x – 30*

*Since the equation is now in slope-intercept form, we see that its slope is* ***15****.*

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