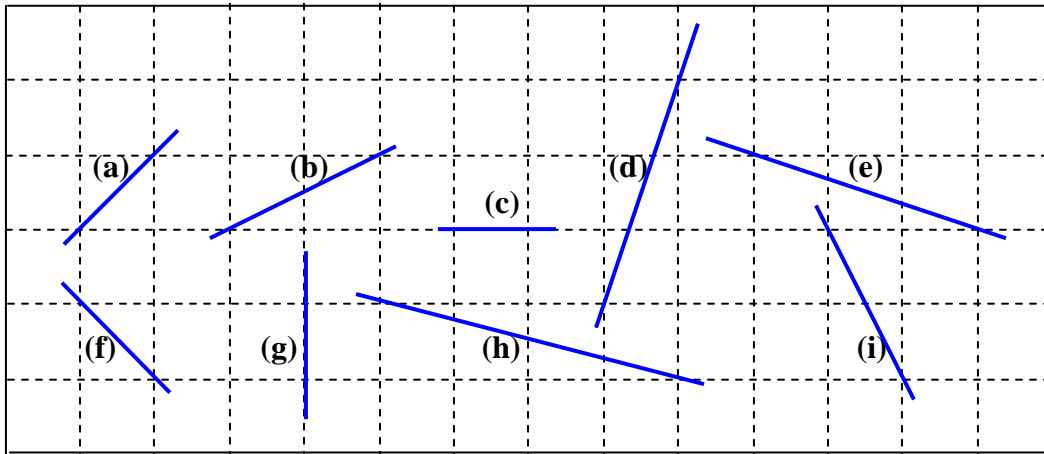


Math 131

Supplementary problems #1 --- Linear Function

1. In the following figure, estimate the slope of each line segment.



2. Find the linear equation of a line that goes through $(0.5, 5)$ and is parallel to the line $4x - 2y = 11$.

3. Find the linear equation of a line with a y -intercept of 2 and is perpendicular to $3x + 2y = 6$.

4. Find a linear equation that goes through $(20, -3.5)$ and increases at a rate of 10 units of y per unit of x .

5. Given $f(x) = -\frac{3}{7}x + \frac{4}{3}$, if x decreases by 5, what is the corresponding change in the function value?

6. Given $g(x) = \frac{1}{3}x - 8$, if the function increases by 9, what is the corresponding change in the value of x ?

7. Do the points $(4, 3)$, $(2, 0)$, and $(-18, -12)$ lie on the same line?

8. A person's tibia bone goes from the ankle to the knee. A male with a tibia of 40 cm in length will be 177 cm in tall, while a tibia of 43 cm in length corresponds to a height of 185 cm.

(a) Write a linear formula for the height, H , of a male as a function of the length, L , of his tibia.

(b) Suppose an archaeologist finds a collection of tibias having lengths of 38 to 45 cm. Assuming that these belonged to males, estimate what their heights would have been.

(c) Estimate the length of the tibia for a height of 190 cm.

Answers:

1.
(a) 1 (b) $1/2$
(c) 0 (d) 3
(e) $-1/3$ (f) -1
(g) Undefined (h) $-1/4$
(i) -2

2. $y = 2x + 4$

3. $y = \frac{2}{3}x + 2$

4. $y = 10x - 203.5$

5. $15/7$

6. 27

7. No.

8. (a) $H = f(L) = 2.67L + 70.2$

(b) The range of heights would have been from 171.66 to 190.35 cm.

(c) 44.87cm