

MATH 1314

Chapter 2.5: Applications of Linear Equations and Modeling

POINT-SLOPE FORMULA

$$y - y_1 = m(x - x_1)$$

$$y = mx + b$$

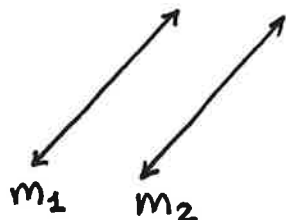
m : SLOPE

(x_1, y_1) : POINT

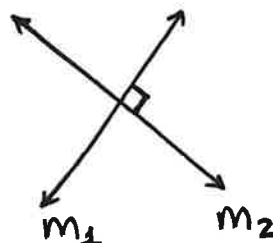
FIND THE EQUATION OF THE LINE PASSING THROUGH $(2, -3)$ WITH SLOPE -4 .

FIND THE EQUATION OF THE LINE PASSING THROUGH $(4, -6)$ AND $(-1, 2)$.

PARALLEL LINES



PERPENDICULAR LINES



FIND THE EQUATION OF THE LINE PASSING THROUGH $(-4, 1)$ AND PARALLEL TO $x + 4y = 3$.

FIND THE EQUATION OF THE LINE PASSING THROUGH $(2, -3)$ AND PERPENDICULAR TO $y = \frac{1}{2}x - 4$.

A FAMILY CELL PHONE PLAN COSTS \$130 PER MONTH FOR FOUR LINES.
EACH ADDITIONAL LINE COSTS \$19.99 PER MONTH.

- a) WRITE A LINEAR FUNCTION TO MODEL THE MONTHLY COST $C(x)$ OF A FAMILY PLAN FOR x ADDITIONAL FAMILY MEMBERS BESIDES THE FIRST FOUR.
- b) EVALUATE AND EXPLAIN $C(3)$.

A VENDOR SELLS LEMONADE FOR \$2.00 A CUP. EACH CUP COSTS \$0.50 TO PREPARE AND THE BOOTH RENTAL IS \$120.00.

a) WRITE A LINEAR FUNCTION
TO PRODUCE X CUPS.

b) WRITE A LINEAR FUNCTION
TO SELL X CUPS.

c) WRITE A LINEAR FUNCTION
FOR THE PROFIT OF X CUPS.

d) FIND THE PROFIT IF
50 CUPS ARE PRODUCED
AND SOLD.

e) FIND THE PROFIT IF
128 CUPS ARE PRODUCED
AND SOLD.

f) FIND THE BREAK-EVEN POINT.