MPM1D WS 5.1 **The Equation of a Line**

Algebraically determine the equation of each of the following lines.

1) Slope of 1, going through $(3,5)$.
2) Slope of -3, going through $(5,-1)$
3) Slope of $\frac{2}{3}$, going through (6, 0)
4) Slope of $\frac{-1}{2}$, going through $(2,-5)$.
5) Through $(4,7)$ and $(6,2)$
6) Through $(-3,4)$ and $(2,-6)$
7) Through $(30,345)$ and $(20,245)$
8) Through $(4,-2)$ and $(10,-2)$
9) Through $(4,-2)$ and $(4,-73)$
10) Slope of $\frac{2}{3}$, going through $(5,6)$

Answers

1) $y = x + 2$
2) $y = -3x + 14$
3) $y = \frac{2}{3}x - 4$
4) $y = \frac{-1}{2}x - 4$
5) $y = \frac{-5}{2}x + 17$
6) $y = 2x + 10$
7) $y = 10x + 45$
8) $y = -2$
9) $x = 4$
10) $y = \frac{2}{3}x + \frac{8}{3}$

MPM1D WS 5.2 **The Equation of a Line– Applications**

1. A balloon rises at a constant rate. In 12 minutes it will be 41 metres high. In 22 minutes it will be 71 m high.
   a) Write an equation relating t, the time, and h, the height.
   b) State the current height of the balloon.
   c) Use the equation to determine the height at 45 minutes.
   d) Use the equation to determine when the balloon will reach a height of 176 metres.

2. Bob's rate of pay (hourly wage) increases by a constant amount each year. In 2 years he'll be earning \$10.85 / h. In 5 years he'll be earning \$12.95 / h.
   a) Write an equation relating t, the time in years, and W, the hourly wage.
   b) State Bob's current rate of pay.
   c) Use the equation to determine Bob's rate of pay in 4 years.

3. At "Lynda's Gourmet Pizza" the cost of a pizza increases at a constant rate according to how many toppings are on the pizza. A 3 topping pizza costs \$13.20. An 8 topping pizza costs \$21.45.
   a) Write an equation relating n, the number of toppings, and C, the cost.
   b) State the cost of a plain pizza.
   c) Use the equation to determine how many toppings you would receive on a \$26.40 pizza.

4. Determine the equation of the line
   a) through (3, -4) and (-3, 1).
   b) through (-1, 5) and (6, -14).

TIPS:

5. A line has the same x intercept as $3x - y - 9 = 0$ and the same y intercept as $x - 2y - 8 = 0$. Find its equation.

6. A line with slope $\frac{1}{2}$ passes through the intersection of $2x - y - 7 = 0$ and $3x + y - 13 = 0$. Find its equation.

ANSWERS

1. a) $h = 3t + 5$ b) 5 m c) 140 m d) 57 minutes
2. a) $W = 0.7t + 9.45$ b) \$9.45 c) \$12.25
3. a) $C = 1.65n + 8.25$ b) \$8.25 c) 11
4. a) $y = \frac{-5}{6}x - \frac{3}{2}$ b) $y = \frac{-19}{7}x + \frac{16}{7}$