

1. The table below shows the daily low temperature in Chicago for one week in February of 2021.

| | | | | | | | |
|------------------------------|----|----|----|----|----|----|----|
| Day of month | 21 | 22 | 23 | 24 | 25 | 26 | 27 |
| Low temperature in °F | 31 | -8 | 0 | -5 | 1 | -8 | -7 |

(a) What was the low temperature on February 25th?

Answer: 1 °F.

(b) When was the low temperature -7 °F?

Answer: On February 27th.

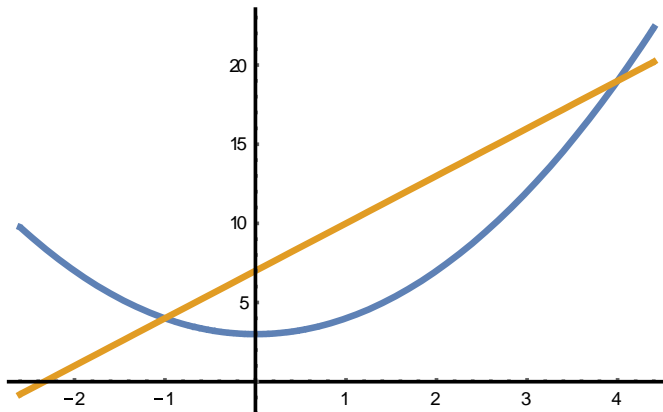
(c) Is the daily low temperature a function of the date? Explain!

Answer: Yes: For each day of the month in row 1, there is a well-determined low-temperature given in the second row, the same column.

(d) Is the date a function of the daily low temperature? Explain!

Answer: No: For example, if the low is -8 °F, then the corresponding day could be either Feb 22nd or Feb 26th. Thus the date cannot be calculated if one knows only the minimum temperature for that day.

2.



If the equation of the parabola above is $f(x) = x^2 + 3$, find the equation of the straight line above.

Solution: It appears that the line and parabola intersect when $x = -1$ and $x = 4$.

Now, since $f(x) = x^2 + 3$, we calculate $f(-1) = 4$ and $f(4) = 17$.

The line that passes through $P = (-1, 4)$ and $Q = (4, 17)$, has slope $m = \frac{17-4}{4-(-1)} = \frac{13}{5}$.

Hence in point-slope form, the equation of the line is $y - 4 = \frac{13}{5}(x - (-1))$.

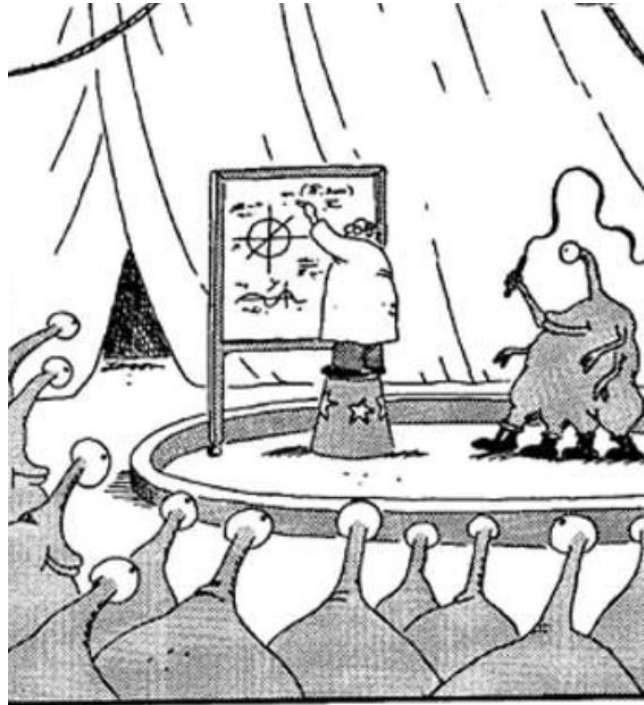
Simplifying, we have, $y - 4 = \frac{13}{5}(x + 1)$.

3. A 2020 Nissan Leaf sells for \$ 43,000 and depreciates by 7 % per year. What is its value in 2023?

Solution: After one year, the Leaf is worth $\$ (0.93)43,000$.

After two years, it is worth $\$ (0.93)^2 43,000$.

After three years, the Leaf is worth $\$ (0.93)^3 43,000 = \$ 34,587.35$.



Abducted by an alien circus company, Professor Winters is forced to write Linear Algebra equations in center ring.