Functions Question Type A

e.g.1 A function is described by the following rule: $f(x) = \frac{-2x}{7} + 1$

a) Determine over which interval this function is positive.

Answer: $]-\infty, 3\frac{1}{2}[$

b) Determine the rate of change of this function. = slope = m

Answer: $-\frac{2}{7}$

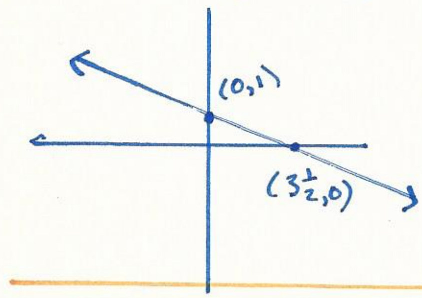
e.g. $y = -\frac{2}{7}x + 1$ ← b

Find x-int: Let $y = 0$

$0 = -\frac{2}{7}x + 1$

$\frac{7}{2}\left(\frac{2}{7}\right)x = (1)\frac{7}{2}$

$x = \frac{7}{2} = 3\frac{1}{2}$



I. You try:

1. A function is described by the following rule: $f(x) = \frac{-4x}{5} + 2$

a) Determine over which interval this function is positive.

Answer: $]-\infty, 2\frac{1}{2}[$

b) Determine the rate of change of this function.

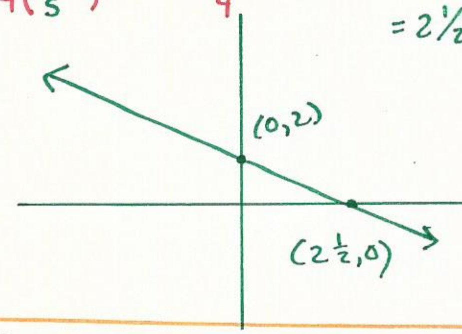
Answer: $-\frac{4}{5}$

① $y = -\frac{4}{5}x + 2$ ← b

$0 = -\frac{4}{5}x + 2$

$\frac{5}{4}\left(\frac{4}{5}x\right) = (2)\frac{5}{4}$

$x = \frac{10}{4} = \frac{5}{2} = 2\frac{1}{2}$



2. A function is described by the following rule: $f(x) = \frac{-3x}{5} + 2$

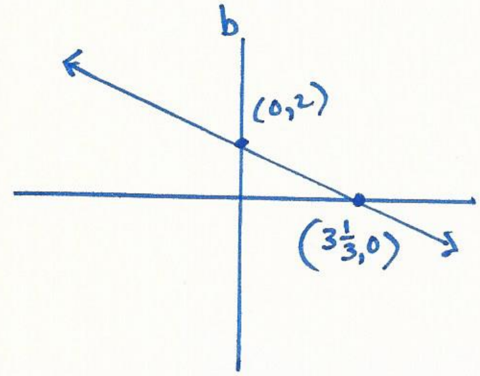
a) Determine over which interval this function is positive.

Answer: $]-\infty, 3\frac{1}{3}[$

b) Determine the rate of change of this function.

Answer: $-\frac{3}{5}$

② $y = -\frac{3}{5}x + 2$ ← b



$0 = -\frac{3}{5}x + 2$

$\frac{5}{3}\left(\frac{3}{5}x\right) = (2)\frac{5}{3}$

$x = \frac{10}{3} = 3\frac{1}{3}$

3. A function is described by the following rule: $f(x) = \dfrac{-5x}{6} + 3$

a) Determine over which interval this function is positive.

Answer: $-\infty, 3\frac{3}{5}\ [$

b) Determine the rate of change of this function.

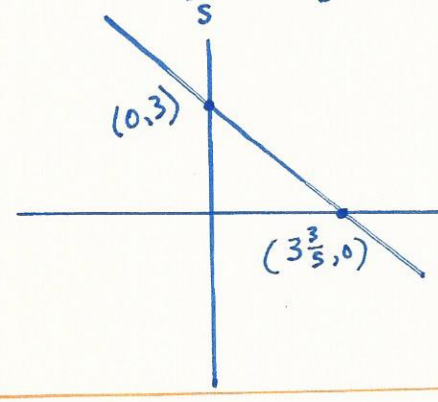
Answer: $-\frac{5}{6}$

③ $y = -\frac{5}{6}x + 3$ ↑ b

$0 = -\frac{5}{6}x + 3$

$\frac{6}{5}\left(\frac{5}{6}x\right) = (3)\frac{6}{5}$

$x = \frac{18}{5} = 3\frac{3}{5}$



4. A function is described by the following rule: $f(x) = \dfrac{-3x}{4} + 2$

a) Determine over which interval this function is positive.

Answer: $-\infty, 2\frac{2}{3}\ [$

b) Determine the rate of change of this function.

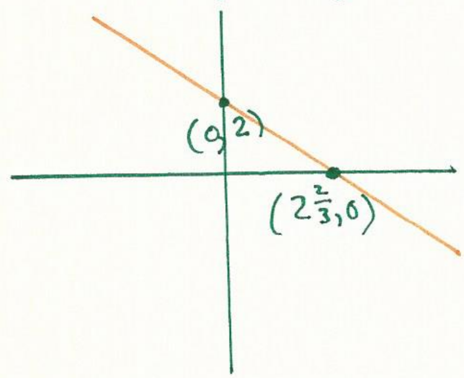
Answer: $\frac{-3}{4}$

④ $y = -\frac{3}{4}x + 2$ ↑ b

$0 = \frac{-3}{4}x + 2$

$\frac{4}{3}\left(\frac{3}{4}x\right) = (2)\frac{4}{3}$

$x = \frac{8}{3} = 2\frac{2}{3}$



5. A function is described by the following rule: $f(x) = \dfrac{-2x}{5} + 3$

a) Determine over which interval this function is positive.

Answer: $-\infty, 7.5\ [$

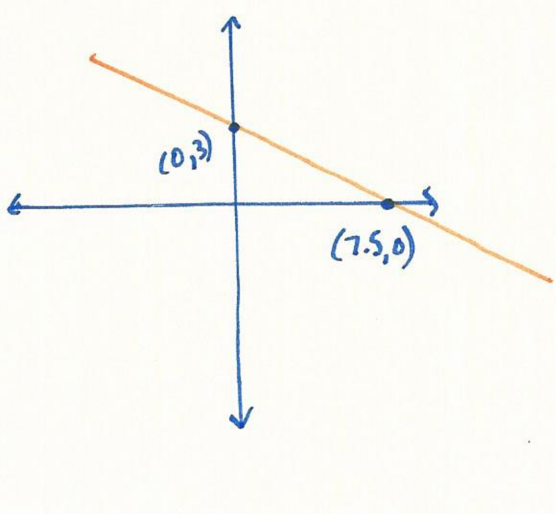
b) Determine the rate of change of this function.

Answer: $-\frac{2}{5}$

⑤ $y = -\frac{2}{5}x + 3$ ↑ b

$\frac{5}{2}\left(\frac{2}{5}x\right) = (3)\frac{5}{2}$

$x = \frac{15}{2} = 7.5$



Let $y = 0$

$0 = \frac{2}{3}x - 1 \leftarrow b$

$\frac{3}{2}(1) = \left(\frac{2}{3}x\right)\frac{3}{2}$

$1.5 = \frac{3}{2} = x$

e.g. 2 A function is described by the following rule: $f(x) = \frac{2x}{3} - 1$

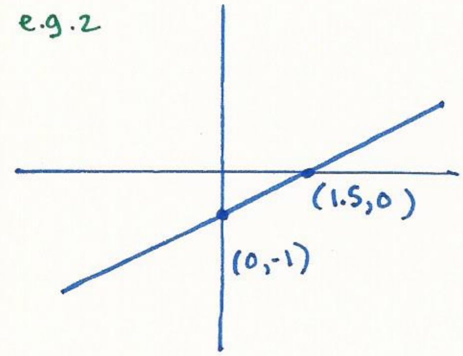
a) Determine over which interval this function is negative.

Answer: $]-\infty, 1.5[$

b) Determine the rate of change of this function.

Answer: $\frac{2}{3}$

e.g.2



II. You try:

1. A function is described by the following rule: $f(x) = \frac{3x}{4} - 1 \leftarrow b$

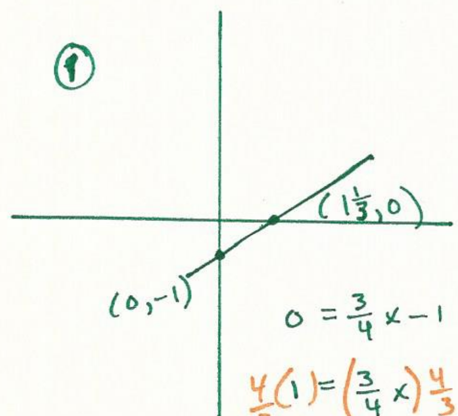
a) Determine over which interval this function is negative.

Answer: $]-\infty, 1\frac{1}{3}[$

b) Determine the rate of change of this function.

Answer: $\frac{3}{4}$

(1)



$0 = \frac{3}{4}x - 1$

$\frac{4}{3}(1) = \left(\frac{3}{4}x\right)\frac{4}{3}$

$x = \frac{4}{3} = 1\frac{1}{3}$

2. A function is described by the following rule: $f(x) = \frac{4x}{3} - 2$

(2) $y = \frac{4}{3}x - 2 \leftarrow b$

$\frac{3}{4}(2) = \left(\frac{4}{3}x\right)\frac{3}{4}$

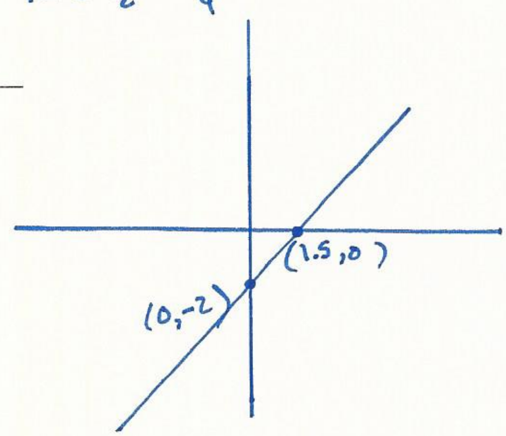
$1.5 = \frac{3}{2} = \frac{6}{4} = x$

a) Determine over which interval this function is negative.

Answer: $]-\infty, 1.5[$

b) Determine the rate of change of this function.

Answer: $\frac{4}{3}$



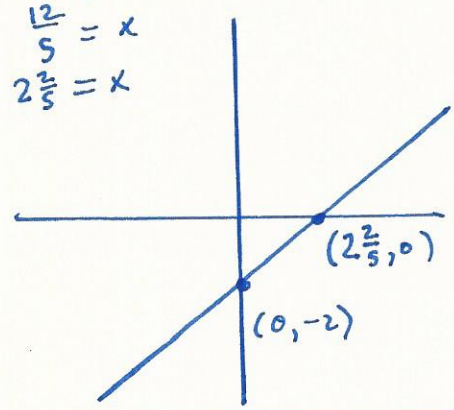
$0 = \frac{5}{6}x - 2$

$\frac{6}{5}(2) = \left(\frac{5}{6}x\right)\frac{6}{5}$

$\frac{12}{5} = x$

$2\frac{2}{5} = x$

3. A function is described by the following rule: $f(x) = \frac{5x}{6} - \overset{b}{2}$



a) Determine over which interval this function is negative.

Answer: $]-\infty, 2\frac{2}{5}[$

b) Determine the rate of change of this function.

Answer: $\frac{5}{6}$

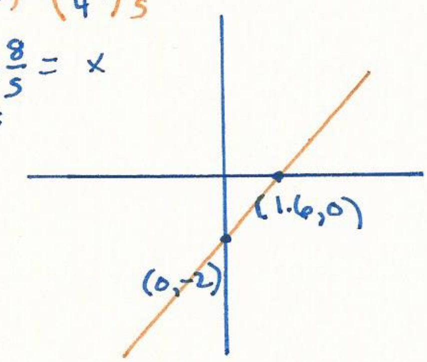
$0 = \frac{5}{4}x - 2$

$\frac{4}{5}(2) = \left(\frac{5}{4}x\right)\frac{4}{5}$

$1\frac{3}{5} = \frac{8}{5} = x$

$1.6 =$

4. A function is described by the following rule: $f(x) = \frac{5x}{4} - 2$



a) Determine over which interval this function is negative.

Answer: $-\infty, 1.6[$

b) Determine the rate of change of this function.

Answer: $\frac{5}{4}$

$0 = \frac{6}{5}x - 3$

$\frac{5}{6}(3) = \left(\frac{6}{5}x\right)\frac{5}{6}$

$\frac{15}{6} = x$

$2.5 = \frac{5}{2} = x$

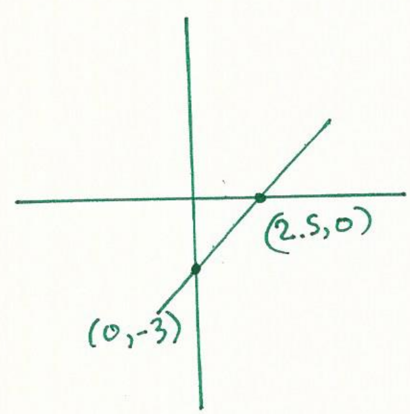
5. A function is described by the following rule: $f(x) = \frac{6x}{5} - 3$

a) Determine over which interval this function is negative.

Answer: $-\infty, 2.5[$

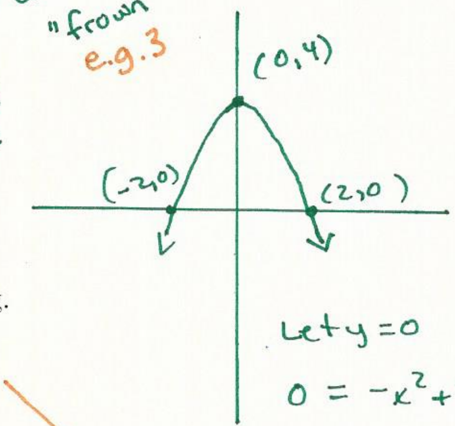
b) Determine the rate of change of this function.

Answer: $\frac{6}{5}$



Quadratic function "frown" e.g. 3 $y\text{-int} = (0, c)$

e.g. 3 A function is described by the following rule: $f(x) = -x^2 + 4$ ← c



a) Determine the interval over which this function is positive.

Answer: $]-2, 2[$

b) Determine the interval over which this function is decreasing.

Answer: $[0, \infty$

Let $y = 0$

$0 = -x^2 + 4$

$0 = 4 - x^2$

$0 = (2-x)(2+x)$

$x_1 = -2 \quad x_2 = 2$

III. You try:

1. A function is described by the following rule: $f(x) = -x^2 + 16$

$y\text{-int} = (0, 16)$

a) Determine the interval over which this function is positive.

Let $y = 0$

$0 = -x^2 + 16$

$0 = 16 - x^2$

$0 = (4-x)(4+x)$

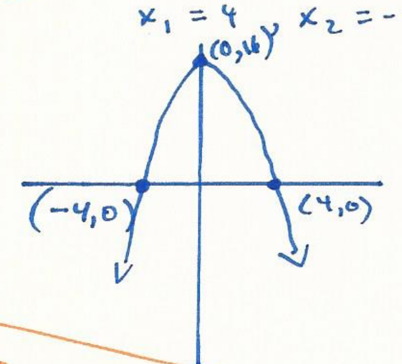
$x_1 = 4, \quad x_2 = -4$

Answer: $]-4, 4[$

b) Determine the interval over which this function is decreasing.

Answer: $[0, \infty$

1



2. A function is described by the following rule: $f(x) = -x^2 + 1$

$y\text{-int} = (0, 1)$

$y = 1 - x^2$

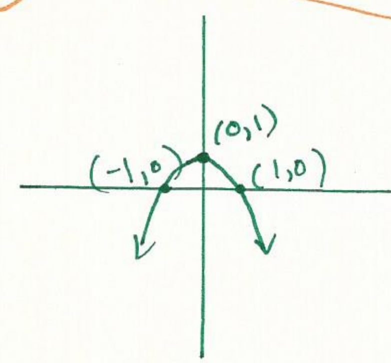
a) Determine the interval over which this function is positive.

Answer: $]-1, 1[$

b) Determine the interval over which this function is decreasing.

Answer: $[0, -\infty$

2



$0 = 1 - x^2$

$0 = (1-x)(1+x)$

$x_1 = -1 \quad x_2 = 1$

3. A function is described by the following rule: $f(x) = -x^2 + 25$

a) Determine the interval over which this function is positive.

Answer: $]-5, 5[$

b) Determine the interval over which this function is decreasing.

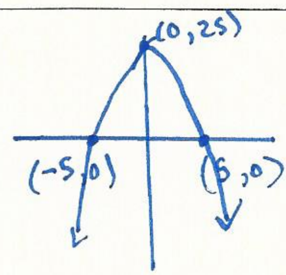
Answer: $[0, \infty$

$y = -x^2 + 25 \leftarrow (0, 25) = y\text{-int}$

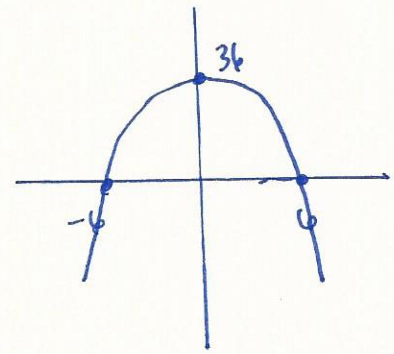
$y = 25 - x^2$

$0 = (5-x)(5+x)$

$x_1 = -5 \quad x_2 = 5$



4. A function is described by the following rule: $f(x) = -x^2 + 36$



a) Determine the interval over which this function is positive.

Answer: [6, 6]

b) Determine the interval over which this function is decreasing.

Answer: [0, ∞

5. A function is described by the following rule: $f(x) = -x^2 + 49$

a) Determine the interval over which this function is positive.

Answer: [-7, 7]

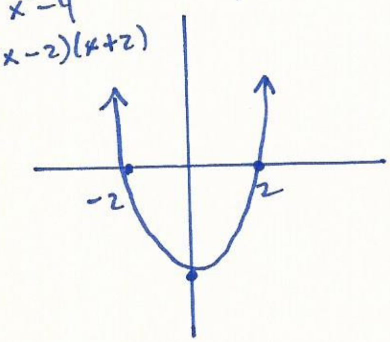
b) Determine the interval over which this function is decreasing.

Answer: [0, ∞

$y = x^2 - 4$

$0 = (x-2)(x+2)$

e.g. 4 A function is described by the following rule: $f(x) = x^2 - 4$



a) Determine the interval over which this function is negative.

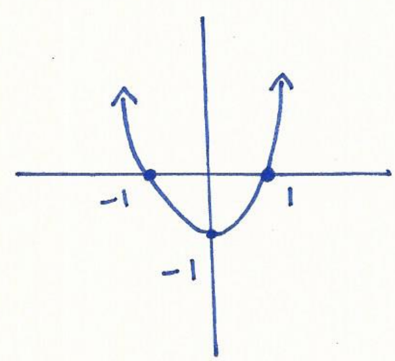
Answer: [-2, 2]

b) Determine the interval over which this function is decreasing.

Answer: $-\infty$, 0]

IV You try:

1. A function is described by the following rule: $f(x) = x^2 - 1$



a) Determine the interval over which this function is negative.

Answer: [-1, 1]

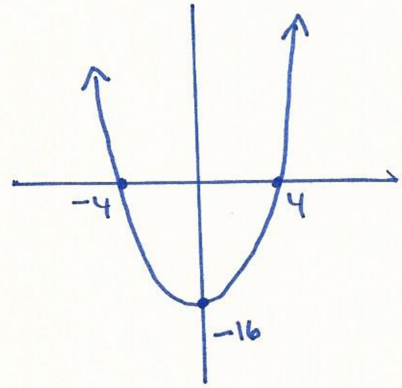
b) Determine the interval over which this function is decreasing.

Answer: $-\infty$, 0]

$0 = x^2 - 1$

$0 = (x-1)(x+1)$

2. A function is described by the following rule: $f(x) = x^2 - 16$



a) Determine the interval over which this function is negative.

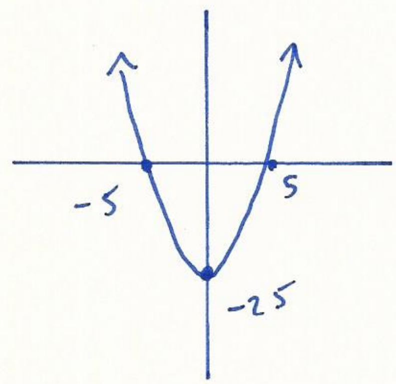
Answer: $[-4, 4]$

b) Determine the interval over which this function is decreasing.

Answer: $-\infty, 0]$

$0 = (x-4)(x+4)$

3. A function is described by the following rule: $f(x) = x^2 - 25$



a) Determine the interval over which this function is negative.

Answer: $[-5, 5]$

b) Determine the interval over which this function is decreasing.

Answer: $-\infty, 0]$

4. A function is described by the following rule: $f(x) = x^2 - 36$

a) Determine the interval over which this function is negative.

Answer: $[-6, 6]$

b) Determine the interval over which this function is decreasing.

Answer: $-\infty, 0]$

5. A function is described by the following rule: $f(x) = x^2 - 49$

a) Determine the interval over which this function is negative.

Answer: $[-7, 7]$

b) Determine the interval over which this function is decreasing.

Answer: $-\infty, 0]$