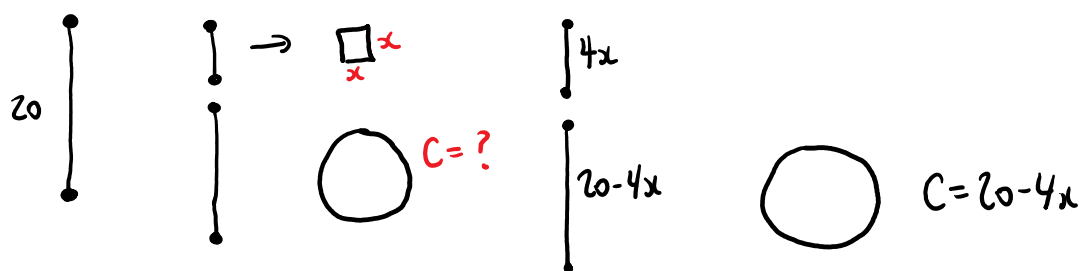


3.6 Building Functions [Geometry Functions]

Ex: A wire of length 20cm is cut in two and bent into a square and a circle.
Express the circle's circumference as a function of the square's side length, x .



Follow-up:

If $x=1$ then $C=16$
 $x=2$ $C=12$
 $x=3$ $C=8$
 ⋮

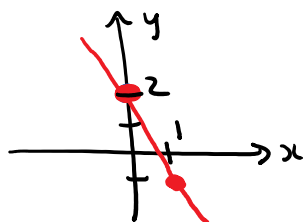
Ch4 : Linear and Parabola Functions

4.1 Linear Functions (Lines)

$$y = mx + b$$

↙ slope ↙ y-intercept

Ex: Graph $y = -3x + 2$



slope = $-\frac{3}{1}$ ← rise
 ← run

The average rate of change of a linear

function is the slope.

A linear function is increasing if $m > 0$ ~~+~~
decreasing if $m < 0$ ~~+~~
constant if $m = 0$ ~~+~~

Ex: Increasing, decreasing or constant?

$$4x + 7y = 3 \rightarrow y = mx + b$$

$$7y = -4x + 3$$

$$y = \frac{-4}{7}x + \frac{3}{7}$$

$$m = \frac{-4}{7}$$

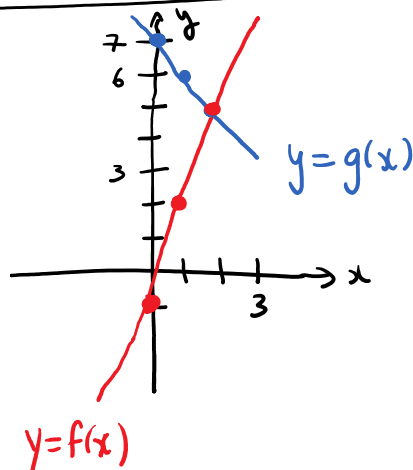
Decreasing

Ex: $f(x) = 3x - 1$ $g(x) = -x + 7$

Solve graphically:

Solve: find x-value(s)

a) Graph



b) Solve $f(x) = 2$

$$\boxed{x=1}$$

c) Solve $f(x) \geq 2$

$$\boxed{x \geq 1}$$

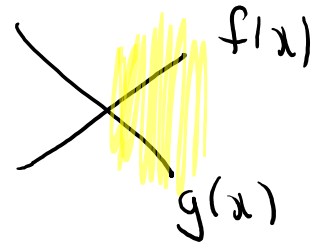
d) Solve $g(x) \geq 6$

$$\boxed{x \leq 1}$$

e) Solve $f(x) = g(x)$

$$\boxed{x = 2}$$

f) Solve $f(x) > g(x)$



$$\boxed{x > 2}$$

Ex: Let $f(x) = 2x - 3$ and $g(x) = 6x - 5$
Solve algebraically:

a) Find the point where $f(x)$ and $g(x)$ intersect.

$$y = y$$

$$2x - 3 = 6x - 5$$

$$2 = 4x$$

$$4x = 2$$

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

Sub $x = \frac{1}{2} \rightarrow$ either $f(x)$ or $g(x)$

$$y = 2x - 3$$

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

$$y = -2$$

$$y = -2$$

$$(x, y) = \left(\frac{1}{2}, -2\right)$$

b) Find the point where $f(x) = 5$

$$f(x) = 2x - 3$$

$$5 = 2x - 3$$

$$8 = 2x$$

$$x = 4$$

$$(x, y) = (4, 5)$$

4.3 Quadratic Functions

(Parabolas)


$$f(x) = ax^2 + bx + c$$

 vertex

$a > 0$

Parabola opens up

Vertex is the lowest point



$a < 0$

Parabola opens down

Vertex is the highest point

