1) Master the Basics

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* console.log(a) → undefined
var a = 10;

* console.log(a) → a not defined

* console.log(a) → Error (Temporal dead zone)
let a = 10;

* Refer to hoisting in JS to learn more

* Sum of numbers
let a = 10;
let b = 20;
console.log(a+b); → 30

10 + 1 → 11
"10" + "1" → 101 (string concatination)

let a = "10"; (type string)
let b = 10; (type number)

* let a = 12;
let b = "13"
console.log (typeof(a+b)); → string

Number + String → String (concatination)

* Concatination example
let a = 10;
let b = 20;
console.log("sum of 10 and 20 " + a + b);
→ sum of 10 and 20 1020

(It's not gonna add, but concat)

→ To get the desired output of sum, use brackets()
console.log("sum of 10 and 20" + (a+b));
↳ priority due to ()
30

guess output:
console.log(10+20+ " is sum of 10 and 20");
→ 30 is ---

* Substraction of string & number
console.log("1" - 1);
→ 0 ? why

It is because, if there is string and number and operator is not "+", it will automatically convert string into number. And this phenomena is called Type coersion.

* Taking Input from user
const age = prompt("What's your age?.");
console.log(typeof age) → string

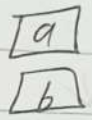
How to change string to Number.
const age = Number(prompt("What's your age?."));

eg: Number("70") → 70 (number)
Number("any string") → Nan

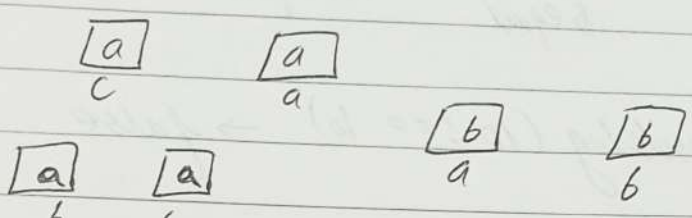
Type casting → manually converting type from one type to another
Eg: string to number.

* Swapping

let a = 10;
let b = 20;



let c = a;
a = b;
b = c;



console.log (a); → 20
console.log (b); → 10

* Method II → using sum

a = a + b; // 30
b = a - b; // 10
a = a - b // 20

* method III → Array destructuring

[a, b] = [b, a]
↓ ↓ ↓ ↓
20 10 20 10

* operators

console.log (22/44) → 0.....
console.log (7/2) → 3.5

To just give, integer by removing decimal part we can use

console.log(Math.floor(22/44)); //0

console.log (7%2) → 1 (remainder)
↓ mod operator
2%7 → 7 (remainder)

* Relational operators

> < <= >= !==

> greater
< smaller
<= smaller & equal
!== not equal

console.log(10 !== 10) → false

= → assigning
== → checks the values only
"10" == 10 → true
=== → checks values & types
"10" === 10 → false
"10": string
10: number

* logical operators

&& both true
|| at least one is true
! inverts boolean value

console.log(10>6 && 5<9) → true
console.log(10<6 || 15<9 || 18>9) → true
false false true

* Unary operator

++ → increament
-- → decrement

let a=5 [Post increment]
console.log(a++); // 5 (returns old value, then increase)
console.log(a); // 6

let x = 5;
console.log(--x); → 4 [Pre decrement]
console.log(x); → 4 (decrease first, then return)

→ let a = true → 1
a++
console.log(a) → 2

let a = false → 0
a++
console.log(a) → 1

* let a = 10++;
console.log(a) → Error, can't add ~~two~~ Unary operator in direct value

# Math functions
Math.round(10.6) → 11 (round off)
Math.round(10.5) → 11

Math.ceil(10.1) → 11
→ increase decimal value by 1

Math.floor(10.8) → 10
→ rounds down to nearest integer

Math.trunc(18.98) → 18
→ removes decimal value & return integer

Math.pow(7, 5) → 32 (7^5)

Math.sqrt(16) → 4 (Square root)

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Math.cbrt(8) → 2 (cube root)

Math.abs(-15) → 15
→ makes negative value in positive

Math.max(7, 4, 1, 8) → 8
→ gives maximum value from numbers

Math.min (7, 4, 1, 8) → 1

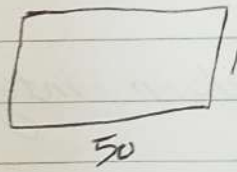
Math.random () → 0.7...
→ returns random value between 0 and 1

0.689 x 10 → 6.8

4 digit random otp
Math.round((Math.random () * 9000) + 1000);

toFixed
let a = 89.0 9835
a.toFixed (2) → 89.09
a.toFixed (3) → 89.098
→ returns string

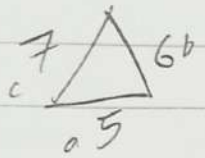
Q1 Area of perimeter of rectangle



Area = l x b
console.log (50 x 10) → 500

Perimeter = 2 (l + b)
= 2 (50 + 10)
= 120

Q2 Area of triangle by herons formula

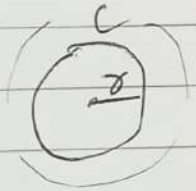


Area of $\Delta = \sqrt{s(s-a)(s-b)(s-c)}$
where $s = \frac{a+b+c}{2}$

```
let a = 5; ...
~~enso~~ let s = (a+b+c) / 2
         s = ~~s.Math.~~ s.toFixed(2)   // x.yz
~~so~~

let area = Math.sqrt( s * (s-a) * (s-b) * (s-c));
area = area.toFixed(2)   //  x.yz
```

Q3) Circumference of circle




```
C = 2πr
let radius = 5
console.log(2 * Math.PI * radius) → ✓
```

Q4) Generate random 4 digit otp

```
let a = Math.random() ; // 0 to 1
a = a * ~~999~~ 8999 → between 0 and 8999
a = a + 1000 ; → between 1000 and 9999
console.log (Math.round(a)); → 4-digit otp
```