```sql
-- 1. Fetch all the paintings which are not displayed in any museums?

      SELECT * FROM `sql-learning-430509.museums.work` where museum_id is null


--2 Are there museums without any paintings?

      SELECT m.name,m.museum_id,w.work_id
      FROM `museums.museum` AS m
      LEFT JOIN `museums.work` AS w
      ON m.museum_id = w.museum_id
      Where m.museum_id is NULL


-- 3) How many paintings have an asking price of more than their regular price?

      select * from `museums.product_size` as mp
      where mp.sale_price > mp.regular_price


-- 4) Identify the paintings whose asking price is less than 50% of its regular price

      select * from `museums.product_size` as pz
      where (pz.regular_price * 0.5) > ( pz.sale_price )


-- 05 Which canva size costs the most?

      select cz.size_id,cz.label,MAX (pz.regular_price ) as RP
      from `museums.canvas_size` as cz
      Inner join `museums.product_size`as pz
      on cz.size_id = SAFE_CAST (pz.size_id AS INT64 )
      group by pz.regular_price ,cz.label, cz.size_id
      ORDER BY RP DESC
      LIMIT 1


--06 Delete duplicate records from work, product_size, subject and image_link tables
```

```sql
-- For Work
CREATE OR REPLACE TABLE `museums.work` AS
SELECT * EXCEPT(count_d)
FROM (
    SELECT *,
    ROW_NUMBER() OVER (PARTITION BY work_id, name, artist_id, style, museum_id
ORDER BY work_id) AS count_d
    FROM `museums.work`
)
WHERE count_d = 1;

-- For product_size
CREATE OR REPLACE TABLE `museums.product_size` AS
SELECT * EXCEPT(count_d)
FROM (
    SELECT *,
    ROW_NUMBER() OVER (PARTITION BY work_id, size_id, sale_price,regular_price
ORDER BY work_id) AS count_d
    FROM `museums.product_size`
)
WHERE count_d = 1;

-- For subject
CREATE OR REPLACE TABLE `museums.subject` AS
SELECT * EXCEPT(count_d)
FROM (
    SELECT *,
    ROW_NUMBER() OVER (PARTITION BY work_id, subject ORDER BY work_id) AS
count_d
    FROM `museums.subject`
)
WHERE count_d = 1;

-- image_link
CREATE OR REPLACE TABLE `museums.image_link` AS
SELECT * EXCEPT(count_d)
FROM (
    SELECT *,
    ROW_NUMBER() OVER (PARTITION BY work_id, url , thumbnail_small_url,
thumbnail_large_url ORDER BY work_id) AS count_d
```

```
        FROM `museums.image_link`
    )
    WHERE count_d = 1;



--07 Identify the museums with invalid city information in the given dataset

    select *
    from `museums.museum`
    where REGEXP_CONTAINS(city, '[0-9]')


-- 9) Fetch the top 10 most famous painting subject

    select subject , sum( 1 ) num
    from `museums.subject`
    group by subject
    order by num desc
    limit 10

--  11 How many museums are open every single day?

    select count(*) museums_open_every_day
    from

    (
    select museum_id, count(1) as num
    from `museums.museum_hours`
    group by museum_id
    having num = 7
    )

-- 19) Identify the artist and the museum where the most expensive and least expensive
painting is placed.
--     Display the artist name, sale_price, painting name, museum name, museum city
and canvas label


    With ranking AS
    (
```

```sql
select *,

rank() over (order by sale_price desc) as Top,
rank() over (order by sale_price) as Bottom

from `museums.product_size`
)

select DISTINCT r.sale_price , art.full_name,w.name as work_name,m.name as
museum_name,m.city , r.top, cz.label
from ranking r
JOIN `museums.work` w
ON r.work_id = w.work_id
JOIN `museums.museum` m
ON m.museum_id = w.museum_id
JOIN `museums.artist` art
ON w.artist_id = art.artist_id
JOIN `museums.canvas_size` cz
ON cz.size_id = CAST( r.size_id AS INT)
where r.Top = 1 or r.Bottom = 1
order by r.top
```