Explore | Expand | Enrich

CLOCKS

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Minute Spaces:

The face or dial of watch is a circle whose circumference is divided into 60 equal parts, called minute spaces.

Hour Hand and Minute Hand:

A clock has two hands, the smaller one is called the **hour hand** or **short hand** while the larger one is called **minute hand** or **long hand**.

CLOCKS

1. In 60 minutes, the minute hand gains 55 minutes on the hour on the hour hand.
2. In every hour, both the hands coincide once.
3. The hands are in the same straight line when they are coincident or opposite to each other.
4. When the two hands are at right angles, they are 15 minute spaces apart.
5. When the hands are in opposite directions, they are 30 minute spaces apart.
6. Angle traced by hour hand in 12 hrs = 360°
7. Angle traced by minute hand in 60 min. = 360°.
8. If a watch or a clock indicates 8.15, when the correct time is 8, it is said to be 15 minutes **too fast**.

   On the other hand, if it indicates 7.45, when the correct time is 8, it is said to be 15 minutes **too slow**.

Question: 01

An accurate clock shows 8 o'clock in the morning. Through how many degrees will the hour hand rotate when the clock shows 2 o'clock in the afternoon?

A. 144°
B. 150°
C. 168°
D. 180°

Answer: D

Explanation:

Angle traced by the hour hand in 6 hours = (360/12)*6 = 180^0

Question: 02

The reflex angle between the hands of a clock at 10.25 is:

A. 180°
B. 195°
C. 197 $(½)^0$
D. 199^0

Answer: C

Explanation:

Angle traced by hour hand in $\frac{125}{12}$ hrs $= \left(\frac{360}{12} \times \frac{125}{12}\right)^\circ = 312\frac{1}{2}^\circ$.

Angle traced by minute hand in 25 min $= \left(\frac{360}{60} \times 25\right)^\circ = 150^\circ$.

$\therefore$ Reflex angle $= 360^\circ - \left(312\frac{1}{2} - 150\right)^\circ = 360^\circ - 162\frac{1}{2}^\circ = 197\frac{1}{2}^\circ$.

Question: 03

A clock is started at noon. By 10 minutes past 5, the hour hand has turned through:

A. 145°
B. 150°
C. 155°
D. 160°

Answer: C

Explanation:

Angle traced by hour hand in 12 hrs = 360°

Angle traced by hour hand in 5 hrs 10 min. *I.e., 31/6 hrs = ((360/12) * (31/6)) = 155^0*

Question: 04

A watch, which gains uniformly, is 2 min, slow at noon on Sunday, and is 4 min 48 seconds fast at 2 PM on the following Sunday when was it correct?

A. 2:00 PM on Tuesday
B. 12 noon on Monday
C. 2:00 AM on Tuesday
D. None of these

Answer: A

Explanation:

Explanation:
From Sunday noon to the following Sunday at 2 PM there are 7 days 2 hours or 170 hours.
The watch gains 2 + 44/ 5 minute in 170 hours.
Therefore, the watch gains 2 minute in 2 *170 × 5 34 hours, i.e. 50 hours.
Now 50 hours = 2 days 2 hours.
Therefore, 2 days 2 hours from Sunday noon = 2 PM on Tuesday.

Question: 05

The angle between the minute hand and the hour hand of a clock when the time is 4.20, is:

A. 0°
B. 10°
C. 5°
D. 20°

Answer: B

Explanation:

Angle traced by hour hand in $\frac{13}{3}$ hrs = $\left(\frac{360}{12} \times \frac{13}{3}\right)^{\circ}$ = 130°.

Angle traced by min. hand in 20 min. = $\left(\frac{360}{60} \times 20\right)^{\circ}$ = 120°.

∴ Required angle = (130 - 120)° = 10°.

Question: 06

A watch which gains uniformly is 6 min slow at 5 p.m. on Monday. On the following Monday at 9 am, it was 10 min 40 seconds fast. When was it correct?

A. 8 : 36 pm. on Thursday
B. 2 : 36 am on Thursday
C. 2 : 36 pm. on Thursday
D. 8 : 36 am on Thursday

Answer: B

Explanation:

The clock has totally gained 16 minutes and 40 sec. i.e. 1000 seconds in 160 hrs. In order to show the right time, the clock has to gain only 6 min i.e. 360 seconds. Just apply the chain rule, the clock gained 1000 sec in 160 hrs, it will gain 360 sec. In 360 × 160/1000 = 288/5 hrs i.e. 57 3/5. Adding 57 hrs & 36 minutes in Monday 5 p.m. you get 2:36 a.m. on Thursday.

Question: 07

At what angle are the hands of a clock inclined at 30 minutes past 8?

A. 95°
B. 75°
C. 92°
D. 97.5°

Answer: B

Explanation: 07

8: 30. Angle between 6 and 8 hour spaces is 30 × 2 = 60°. For additional 30 min, angle = 30 = 15°. Hence, required angle = 60 + 15 = 75°

Question: 08

How many times are the hands of a clock at right angles in a span of twenty four hours?

A. 48 times
B. 44 times
C. 46 times
D. 22 times

Answer: B

Explanation: 08

In a span of 12 hrs, the hands of a clock are at right angles exactly 22 times. So, in a span of 24 hrs, they are at right angles exactly 44 times.

Question: 09

How many times in a span of 24 hours are the hands of a clock straight (that is either overlap or exactly opposite to each other) ?

A. 43 times
B. 46 times
C. 45 times
D. 44 times

Answer: D

Explanation:

In a span of 24 hours, the hands of a clock are in opposite directions exactly 22 times & hands of a clock coincide exactly 22 times in a span of 24 hours. Therefore, they are straight 22 + 22 i.e. 44 times in a span of 24 hours.

Question: 10

Find at what time between 7 o’clock and 8 o’clock will the hands of a clock be in the same straight line but not overlap each other.

A. 10(9/11) min past 8
B. 5(5/11) min past 7
C. 10(8/11) min past 8
D. 10(7/11) min past 8

Answer: D

Explanation:

Between 7 and 8, the hands will be in opposite directions at (5 7 – 30)(12/11) = 60/11 min.
i.e.5(5/11) min past 7.

Question: 11

When the hands of a clock show 4 o’clock, the angle between them is

A. 100°
B. 120°
C. 130°
D. 150°

Answer: B

Explanation: 11

Required angle will be 30 4 = 120°, because between 12 and 5 there are 4 hours and each hour = 30°.

Question: 12

In one and half hours, the minute hand of a clock rotates through an angle of

A. 720°
B. 540°
C. 600°
D. 420°

Answer: B

Explanation:

In one and half hours, the minute hand of a clock rotates through an angle of 1.5*360 = 540.

Question: 13

A clock is set right at 10 a.m. on Monday. The clock loses 15 min. in 24 hrs. What will be the true time when the clock indicates 4 am on the following Saturday?

A. 5:12 am
B. 5:32 am
C. 6:32 am
D. 5:48 am

Answer: A

Explanation:

From 10 am on 1st day to 4 am on 5th day is total 114 hours. When a clock loses 15 min, then 23 hours 45 min of this clock are the same as 24 hours of correct clock i.e. 95/4 hours of this clock = 24 hours of correct clock. 95/4 hours of this clock =((24×4/95)×114) hours of correct clock = 115.2 hours of correct clock which is equal to 115 hours 12 minThe correct time is 5:12 am.

Question: 14

When the time is 5:40, then what is the angle b/w the hour hand & the minute hand of a clock?

A. 70°
B. 60°
C. 74°
D. 80°

Answer: A

Explanation:

Formula used= $\theta = (11/2)M$ -30H where, H= hours, M= minutes
H= 5 , M= 40
Required angle, $\theta = (11/2)40$ -30×5 = 70°

Question: 15

At what time between 2 and 3 o’clock will the hands of a clock be together?

A. 10(10/11)min. past 2
B. 10 min. past 2
C. 20(10/11)min. past 2
D. 12 min. past 2

Answer: A

Explanation:

At 2 o’ clock, the hour hand is at 2 and the minute hand is at 12. So, they are 10 min. spaces apart. To be together, the minute hand must gain 10 minutes over the hour hand.
Now, 55 minutes are gained by it in 60 min. So, 10 minutes will be gained in (60/55)×10 min.
= 10(10/11) min
The hands will coincide at 10(10/11) min. past 2.

THANK YOU