

Answers

1. Answer: d

Explanation:

Amarkantak plateau is correct.

The Narmada rises from a kund at Amarkantak, on the Maikal range in the Anuppur district of Madhya Pradesh, at a height of about 1,057 m.

It then flows west through a rift valley between the Vindhya and Satpura ranges and enters the Arabian Sea through the Gulf of Khambhat, making it the largest west-flowing river of peninsular India.

Trimbakeshwar near Nashik is the source of the Godavari, and Multai in Betul district is the source of the Tapi.

2. Answer: b

Explanation:

M. S. Swaminathan is correct.

Agricultural scientist M. S. Swaminathan led the introduction of high-yielding dwarf wheat and rice varieties in India in the 1960s, backed by irrigation, fertilisers and assured prices. Wheat output rose sharply and India moved towards self-sufficiency in food grains.

Norman Borlaug is called the father of the Green Revolution worldwide; in India the title goes to Swaminathan.

Verghese Kurien led the White Revolution in milk, E. Sreedharan is known as the Metro Man, and C. Subramaniam was the Union Agriculture Minister who supported the policy.

3. Answer: d

Explanation:

Uttar Pradesh is correct.

Kushinagar, in the Kushinagar district of eastern Uttar Pradesh, is the place where Gautama Buddha attained Mahaparinirvana. The Mahaparinirvana Temple with its reclining Buddha statue and the Ramabhar Stupa stand there.

It is one of the four main Buddhist pilgrimage sites, along with Lumbini (birth, in Nepal), Bodh Gaya (enlightenment, in Bihar) and Sarnath (first sermon, in Uttar Pradesh).

4. Answer: d

Explanation:

Krishna river is correct.

The Amaravati School of art grew around the great stupa at Amaravati in present-day Andhra Pradesh, on the banks of the lower Krishna, mainly under the Satavahanas and later the Ikshvakus.

Its reliefs were carved in white limestone and show scenes from the Buddha's life and Jataka tales with lively, crowded compositions.

Gandhara art grew in the north-west near the Indus region, and Mathura art grew on the Yamuna, so the other rivers do not fit.

5. Answer: d

Explanation:

1853 is correct.

The first passenger train in British India ran on 16 April 1853 from Bori Bunder (Bombay) to Thane, covering about 34 km with 14 carriages hauled by three locomotives named Sahib, Sultan and Sindh.

The line was built by the Great Indian Peninsula Railway during the time of Governor-General Lord Dalhousie, who is regarded as the father of Indian Railways.

6. Answer: d

Explanation:

Football is correct.

In football the ball is passed and kicked with the feet, headed by players, and thrown in with both hands from the touchline after it goes out of play.

Hockey is played with sticks, volleyball is played mainly with the hands over a net with no throw-ins, and kabaddi uses no ball at all, so only football involves all four actions.

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7. Answer: d

Explanation:

Africa is correct.

The Prime Meridian is the 0° longitude line passing through Greenwich, London. From the North Pole it crosses Europe (the United Kingdom, France and Spain), then Africa (Algeria, Mali, Burkina Faso, Togo and Ghana), and finally Antarctica.

It lies far west of Asia and Australia and far east of North America, so none of those continents is crossed.

8. Answer: a

Explanation:

China is correct.

The Loess Plateau lies in north-central China, around the middle reaches of the Huang He (Yellow River). It is built of thick layers of loess, a fine yellowish silt carried and deposited by wind from the deserts to the north-west.

The loose silt erodes easily, and the sediment washed into the river gives the Huang He its yellow colour and name.

9. Answer: b

Explanation:

Bengal is correct.

In 1793 Governor-General Charles Cornwallis introduced the Permanent Settlement in Bengal, which then also covered Bihar and Odisha.

Under it the zamindars were recognised as owners of the land and the land revenue they had to pay to the East India Company was fixed permanently. The Company gained a stable income, while cultivators were left at the mercy of the zamindars.

Punjab, Rajasthan and Karnataka were not under this system; the Ryotwari system was used later in much of the south.

10. Answer: a

Explanation:

Non-renewable resources is correct.

Non-renewable resources form over millions of years, so once they are used up they cannot be replaced within a human time scale. Coal, petroleum, natural gas and most minerals are examples, and their stocks keep falling with use.

Renewable resources such as sunlight, wind, water and forests are replenished by natural processes, so they do not run out with careful use.

11. Answer: a

Explanation:

Diffused reflection is correct.

On a rough or uneven surface, the normal at each tiny part of the surface points in a different direction. Each ray still obeys the laws of reflection, but because the normals differ, parallel incident rays leave in different directions.

This scattering is called diffused (irregular) reflection. It lets us see objects such as paper or a wall from any side.

Regular reflection happens on smooth surfaces like a plane mirror, where parallel rays stay parallel after reflection.

12. Answer: b

Explanation:

Warren Hastings is correct.

The First Anglo-Maratha War was fought from 1775 to 1782 and ended with the Treaty of Salbai in 1782. Warren Hastings was Governor-General of Bengal from 1773 to 1785, so the whole war fell within his term.

Cornwallis served from 1786 to 1793, Wellesley from 1798 to 1805 (Second Anglo-Maratha War) and William Bentinck from 1828 to 1835, all after this war.

13. Answer: a

Explanation:

Article 44 is correct.

Article 44, in Part IV of the Constitution among the Directive Principles of State Policy, says that the State shall endeavour to secure for citizens a Uniform Civil Code throughout the territory of India.

Article 41 covers the right to work, education and public assistance, Article 42 covers just and humane conditions of work and maternity relief, and Article 43 covers a living wage for workers.

14. Answer: d

Explanation:

Earthing is correct.

The earth is a very large conductor and can accept or give any amount of charge. When a charged object is connected to the earth through a conductor, its charge flows into the earth and the object becomes neutral. This process is called earthing (grounding).

In buildings, a metal wire buried deep in the ground is joined to the metal bodies of appliances, so any leaked charge passes safely to the earth instead of through a person.

15. Answer: a

Explanation:

Private sector is correct.

TISCO was set up in 1907 at Jamshedpur by the Tata family, following the plan of Jamsetji Tata, and it has always been owned and run by private shareholders of the Tata group. It is now known as Tata Steel.

Public sector and central public sector enterprises are owned by the government, such as the Steel Authority of India Limited (SAIL), so TISCO belongs to the private sector.

16. Answer: a

Explanation:

Anumiti (Inference) is correct.

Anumana is one of the pramanas (valid means of knowledge) in Indian philosophy, especially in the Nyaya school. It means inference: reaching new knowledge from a known sign, as in inferring fire on a hill from the smoke seen there.

The knowledge produced by this process is called anumiti. Asakti means attachment, anubhuti means direct experience or feeling, and shravana means hearing, so they do not express inference.

17. Answer: c

Explanation:

Nagaland is correct.

The Hornbill Festival is held every year from 1 to 10 December at Kisama Heritage Village near Kohima, Nagaland. Started by the state government in 2000, it brings together all the Naga tribes to show their dances, songs, food, crafts and traditional games.

It is named after the hornbill, a bird that appears widely in Naga folklore and is respected by the tribes, which is why it is called the Festival of Festivals of Nagaland.

18. Answer: d

Explanation:

1969 is correct.

The DMK government led by C. N. Annadurai moved to rename Madras State. Parliament passed the Madras State (Alteration of Name) Act, 1968, and the new name Tamil Nadu came into effect on 14 January 1969.

The name means 'land of the Tamils'. The capital city of Madras kept its old name until 1996, when it was renamed Chennai.

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19. Answer: b

Explanation:

Football is correct.

In football, a corner kick is awarded to the attacking team when the whole ball crosses the goal line, outside the goal, after last touching a player of the defending team. The kick is taken from the corner arc nearest to where the ball went out.

Cricket, volleyball and luge (a sled race on ice) have no such restart, so the term belongs only to football.

20. Answer: c

Explanation:

Anamudi is correct.

Anamudi, about 2,695 m high, rises in the Anaimalai Hills of the Western Ghats in the Idukki district of Kerala, inside Eravikulam National Park. It is the highest peak in India south of the Himalayas.

Doddabetta (about 2,637 m) is the highest peak of the Nilgiris and Mukurthi (about 2,554 m) is also in the Nilgiris, both lower than Anamudi, while Kodaikanal is a hill station in the Palani Hills, not a peak.

21. Answer: c

Explanation:

Article 300 (A) is correct.

The right to property was originally a fundamental right under Articles 19(1)(f) and 31. The 44th Constitutional Amendment Act, 1978 removed it from Part III and inserted Article 300A in Part XII, which states that no person shall be deprived of his property save by authority of law.

So it is now a constitutional (legal) right. Article 42 deals with humane conditions of work and maternity relief, and Article 214 provides for a High Court for each State.

22. Answer: b

Explanation:

Uttar Pradesh is correct.

Lok Sabha seats are allotted to states broadly in proportion to their population. Uttar Pradesh, the most populous state, has 80 seats, the highest of any state.

Among the other states listed, Maharashtra has 48 seats, West Bengal has 42 and Tamil Nadu has 39.

23. Answer: a

Explanation:

Food, clothing and shelter is correct.

A minimum wage is the lowest pay that an employer must legally give a worker. It is fixed so that a worker can at least meet the basic needs of life for himself and his family, and these basic needs are food, clothing and shelter.

In India minimum wages are set under laws such as the Minimum Wages Act, 1948. Employment, investment, marriage or cars are not part of the needs a minimum wage is meant to cover.

24. Answer: a

Explanation:

Calorific value is correct.

The calorific value of a fuel is the amount of heat energy produced when 1 kg of the fuel burns completely in air. It is measured in kilojoules per kilogram (kJ/kg).

A higher calorific value means a better fuel. For example, LPG has a calorific value of about 55,000 kJ/kg, while cow-dung cakes give only about 6,000 to 8,000 kJ/kg, and hydrogen has one of the highest values of all fuels.

25. Answer: b

Explanation:

Spain is correct.

Rafael Nadal was born in 1986 in Manacor on the Spanish island of Mallorca and has represented Spain throughout his career, including in Davis Cup wins and an Olympic singles gold in 2008.

Known as the King of Clay, he has won the French Open a record number of times and is one of the greatest players in the history of men's tennis.

26. Answer: b

Explanation:

Article 370 is correct.

Article 370, placed in Part XXI of the Constitution under temporary, transitional and special provisions, gave Jammu and Kashmir a special status, with its own constitution and limited application of central laws. It was made inoperative in August 2019.

Article 45 deals with early childhood care and education, Article 49 with the protection of monuments, and Article 376 with provisions for judges of High Courts.

27. Answer: c

Explanation:

Madras Mahajan Sabha is correct.

The Madras Mahajan Sabha was founded in May 1884 by M. Viraraghavachari, G. Subramania Iyer and P. Ananda Charlu. It was one of the early political associations of South India that raised public demands before the British government.

It came a year before the Indian National Congress (1885), and its leaders took part in founding the Congress. The Brahma Sabha, by contrast, was a religious body started by Raja Ram Mohan Roy in 1828.

28. Answer: a

Explanation:

Combustion is correct.

Combustion is a reaction in which a substance reacts with oxygen and gives out heat, and usually light as well. The substance that burns is called a combustible substance or fuel.

For example, when methane burns: $\text{CH}_4 + 2\text{O}_2 \rightarrow \text{CO}_2 + 2\text{H}_2\text{O} + \text{heat}$.

Oxidation is the wider term for any gain of oxygen and need not release noticeable heat, as in slow rusting, and an explosion is only a very rapid form of combustion.

29. Answer: a

Explanation:

Portugal is correct.

Port wine is a sweet fortified wine made from grapes grown in the Douro Valley of northern Portugal. Grape brandy is added during fermentation, which stops it early and keeps the wine sweet and strong.

It takes its name from the city of Porto, from where it was traditionally aged and shipped abroad. Only wine from this Portuguese region may legally be sold as port.

30. Answer: b

Explanation:

Fundamental Rights is correct.

The Magna Carta of 1215 was the English charter that first limited the power of the king and protected the liberties of subjects. In the same way, Part III of the Indian Constitution (Articles 12 to 35) guarantees Fundamental Rights to citizens against arbitrary action by the State, and these are enforceable in courts.

Hence Part III is called the Magna Carta of India. Directive Principles and Fundamental Duties are not enforceable in courts, and the Preamble is described as the identity card or key of the Constitution.

31. Answer: d

Explanation:

Seismic Zone is correct.

Regions where earthquakes occur most often or with the greatest intensity are called seismic zones. They usually lie along active tectonic plate boundaries and major fault lines.

The Bureau of Indian Standards divides India into four seismic zones, Zone II to Zone V; Zone V, which includes the North-East and parts of the Himalaya, is the most earthquake-prone.

The Richter scale only measures the magnitude of an earthquake and does not name any zone, while environmental and plane zones are not terms used to classify

earthquake risk.

32. Answer: c

Explanation:

People who live in less than \$ 1.90 a day is correct.

The World Bank measures extreme poverty with its international poverty line. In October 2015 it revised this line to \$1.90 per person per day, measured at 2011 purchasing power parity (PPP) prices.

The earlier line was 1.25 a day at 2005 PPP prices, and the older benchmark was about 1 a day; neither 1.5 nor 2 a day was the official extreme-poverty line.

So a person living on less than \$1.90 a day was counted as living in extreme poverty when this paper was set.

33. Answer: b

Explanation:

Oviparous is correct.

Oviparous animals lay eggs, and the embryo develops inside the egg outside the mother's body until it hatches. Birds, most reptiles, amphibians, most fish and insects are oviparous.

Viviparous animals give birth to live young that develop inside the mother's body, as in most mammals, so the term mammals does not describe egg-laying as such.

Nulliparous is a term for a female that has never given birth; it is not a mode of reproduction.

34. Answer: a

Explanation:

Prime Minister is correct.

A parliamentary system has two heads: a nominal head of state and a real head of government. In India the President is the head of state, while real executive power is exercised by the Council of Ministers headed by the Prime Minister (Articles 74 and 75).

The Prime Minister leads the government, and the Council of Ministers is collectively responsible to the Lok Sabha.

The Chief Justice of India heads the judiciary, and the Cabinet Secretary is the senior-most civil servant, so neither is the head of government.

35. Answer: d

Explanation:

Saikhom Mirabai Chanu is correct.

The Rajiv Gandhi Khel Ratna Award 2018, India's highest sporting honour, was conferred jointly on weightlifter Saikhom Mirabai Chanu and cricketer Virat Kohli.

Mirabai Chanu had won gold in the 48 kg category at the 2017 World Weightlifting Championships and gold at the 2018 Commonwealth Games.

Sachin Tendulkar received the Khel Ratna for 1997–98 and P.V. Sindhu in 2016, while Ajinkya Rahane received the Arjuna Award in 2016.

36. Answer: d

Explanation:

Establishment and Formation of Supreme Court is correct.

Article 124 opens Chapter IV (The Union Judiciary) of Part V of the Constitution. It establishes the Supreme Court of India, consisting of the Chief Justice of India and other judges, and lays down how judges are appointed and removed.

The other subjects are covered by different articles: the annual financial statement (budget) by Article 112, the All India Services by Article 312 and a national emergency by Article 352.

37. Answer: c

Explanation:

Kadambini Ganguly is correct.

In 1883 Kadambini Ganguly, along with Chandramukhi Basu, graduated from the University of Calcutta, becoming the first women graduates of the university and among the first in the British Empire.

She went on to study medicine and became one of the first Indian women to practise Western medicine.

Sarojini Naidu was a poet and the first Indian woman to preside over the Indian National Congress, while Kalpana Dutt and Bina Das were revolutionaries of Bengal.

38. Answer: c

Explanation:

Lake Athabasca is correct.

The Great Lakes of North America lie along the border between the United States and Canada. They are Lake Superior, Lake Michigan, Lake Huron, Lake Erie and Lake Ontario, often remembered with the word HOMES.

Lake Huron, Lake Ontario and Lake Erie are therefore members of the group.

Lake Athabasca lies far to the north-west, in the Canadian provinces of Alberta and Saskatchewan, and is not part of the Great Lakes system.

39. Answer: a

Explanation:

Mahatma Gandhi is correct.

Gandhi went to South Africa in 1893 as a legal adviser and soon faced racial discrimination against Indians living there.

To organise the Indian community against discriminatory laws, such as the bill to take away the voting rights of Indians in Natal, he founded the Natal Indian Congress at Durban and served as its first secretary.

Subhash Chandra Bose and Jawaharlal Nehru rose as leaders in India much later, and Dadabhai Naoroji worked in India and Britain, not in South Africa.

40. Answer: b

Explanation:

Malleability is correct.

Malleability is the property by which a metal can be hammered or beaten into thin sheets without breaking. Gold and silver are the most malleable metals; gold can be beaten into extremely thin gold leaf.

Ductility is a different property: it is the ability of a metal to be drawn into thin wires.

Resistance is the opposition a material offers to the flow of electric current, and stretch is not the name of a metallic property.

41. Answer: b

Explanation:

101st Amendment is correct.

The Constitution (One Hundred and First Amendment) Act, 2016 paved the way for the Goods and Services Tax. It inserted Article 246A, giving Parliament and the states concurrent power to levy GST, Article 269A on GST for inter-state supplies and Article 279A creating the GST Council.

GST came into force on 1 July 2017.

The 73rd and 74th Amendments (1992) deal with panchayats and municipalities, and the 42nd Amendment (1976) added words such as socialist and secular to the Preamble along with Fundamental Duties.

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42. Answer: d

Explanation:

4x100m Relay is correct.

In a relay race a team of four runners covers the distance in legs. In the 4x100m relay each athlete runs about 100 metres and then hands a baton to the next runner.

The baton must be passed within a marked exchange zone; dropping it outside the rules or passing it outside the zone leads to disqualification.

The 400 metres and 100 metres sprints are individual races, and the long jump is a field event, so none of them involves passing a baton.

43. Answer: a

Explanation:

Uttarakhand is correct.

Bugyals are high-altitude alpine meadows of the Garhwal and Kumaon Himalaya in Uttarakhand, found roughly between 3,000 and 4,000 metres, above the tree line and below the snow line.

In summer they are covered with grasses and wild flowers and are used as grazing pastures by pastoral communities. Well-known examples are Bedni Bugyal, Dayara Bugyal and Auli.

Similar meadows in Kashmir are called margs, as in Gulmarg and Sonamarg, so the name bugyal belongs to Uttarakhand.

44. Answer: b

Explanation:

Shipki La Pass is correct.

The Sutlej rises near Lake Mansarovar and Rakas Tal in Tibet and flows west across the Tibetan plateau.

It enters India through the Shipki La pass in the Kinnaur district of Himachal Pradesh, where the pass also carries a road link towards Tibet.

Zoji La links the Kashmir valley with Ladakh, and Nathu La connects Sikkim with Tibet; the Sutlej does not flow through either of these, nor through Thang La.

45. Answer: b

Explanation:

Gymnastics is correct.

Floor exercise is one of the apparatus events of artistic gymnastics for both men and women. It is performed on a square sprung floor about 12 metres by 12 metres.

A routine combines tumbling passes, leaps, turns and balance elements; in the women's event it is performed to music.

Football, cricket and swimming have no floor exercise event, since they are played on a field or in a pool.

46. Answer: a

Explanation:

Coal is correct.

Non-conventional sources of energy are renewable sources that are replenished by nature, such as solar, wind, tidal, geothermal and biomass energy. Their large-scale use is relatively recent.

Coal is a fossil fuel formed from plant remains buried over millions of years. It is exhaustible and has been used on a large scale for a long time, so it is a conventional source of energy, along with petroleum and natural gas.

Solar, wind and tidal energy are therefore non-conventional, while coal is not.

47. Answer: d

Explanation:

Council of Ministers is correct.

India follows the cabinet form of parliamentary government. Under Article 74, there is a Council of Ministers with the Prime Minister at its head to aid and advise the President.

Under Article 75(3), the Council of Ministers is collectively responsible to the Lok Sabha, so major decisions of the Prime Minister are taken together with the Council of Ministers rather than alone.

The Home Minister and the External Affairs Minister are individual members of the Council, and the Cabinet Secretary is a civil servant, not a political body whose consent is required.

48. Answer: b

Explanation:

Target site is correct.

Endocrine glands are ductless glands. They release their hormones directly into the blood, which carries them throughout the body.

A hormone acts only on the particular organ or tissue whose cells carry receptors for it; this organ is called the target site or target organ.

For example, thyroid-stimulating hormone from the pituitary acts on the thyroid gland, and insulin from the pancreas acts on the liver and muscles. Hormonal site, blood site and endocrine site are not the accepted terms.

49. Answer: d

Explanation:

Mortality rate is correct.

The mortality rate, also called the crude death rate, is the number of deaths per 1,000 people in a given period, usually one year.

It is calculated as $\frac{D}{P} \times 1000$, where D is the number of deaths in the year and P is the mid-year population.

Infant mortality counts deaths of children below one year per 1,000 live births, the maternal mortality rate counts maternal deaths per 100,000 live births, and the birth rate counts live births per 1,000 people.

50. Answer: b**Explanation:**

Budding is correct.

Hydra reproduces asexually by budding. Repeated cell division at a particular site on its body produces a small outgrowth called a bud.

The bud grows, develops a mouth and tentacles, and finally detaches from the parent to live as a new, independent Hydra.

Binary fission is the splitting of a single-celled organism such as Amoeba into two, conversion is not a mode of reproduction, and anthropogenous means caused by human activity.

51. Answer: b**Explanation:**

Thursday is correct.

In the first pair, July is the month that comes immediately after June in the calendar, so the relation is a term and the one that directly follows it in a fixed order.

Applying the same relation to the days of the week, the day that comes immediately after Wednesday is Thursday.

Desk, Mango and Pen are ordinary objects, not days of the week, so they cannot follow the same logic.

52. Answer: b

Explanation:

Laces is correct.

A waistcoat is fastened and closed with buttons, so the first pair links an item of clothing with the thing used to fasten it.

In the same way, a boot is fastened and tightened with laces, which are threaded through its eyelets and tied.

Eat is an action, a bag is a separate article and a tree is a plant, so none of them fastens a boot.

53. Answer: b

Explanation:

KFAWV is correct.

In ADMIT $\rightarrow$ GDIWL, the first two letters each move 3 places forward ($A \rightarrow D$, $D \rightarrow G$) and are written in reverse order, giving GD.

The middle letter moves 4 places back ($M \rightarrow I$).

The last two letters each move 3 places forward ($I \rightarrow L$, $T \rightarrow W$) and are written in reverse order, giving WL.

For CHEST: $C \rightarrow F$ and $H \rightarrow K$, written as KF; E moves 4 places back to A; $S \rightarrow V$ and $T \rightarrow W$, written as WV. So CHEST is coded as KFAWV.

54. Answer: c

Explanation:

P3Q5R7S is correct.

Decode each part: P3Q means P is the father of Q; Q5R means Q is the sister of R; R7S means R is the brother of S.

So Q, R and S are siblings, and P, being the father of Q, is also the father of R and S. Hence P is the father of S.

In P4Q5R7S, P is a mother; in P7Q5R3S, R is the father of S and P is S's uncle; in P5Q5R3S, P is female. None of these shows P as the father of S.

55. Answer: c

Explanation:

Grandson is correct.

Start from the man's wife. Her only daughter-in-law is the wife of her son, and her son is also the man's son.

The boy is the son of this daughter-in-law, so he is the son of the man's son.

The son of one's son is one's grandson, so the boy is the man's grandson. He cannot be the man's own son or nephew, because he is born to the man's daughter-in-law.

56. Answer: b

Explanation:

D is correct: neither conclusion i nor ii is logical.

Conclusion i does not follow. Painting a house does not mean that the house is new; an existing house can be repainted at any time.

Conclusion ii does not follow either. The statement says nothing about the cost of emulsion or distemper; the choice of emulsion could be made for its look, durability or any other reason.

Since neither conclusion can be drawn from the statement, the answer is D.

57. Answer: a

Explanation:

The correct figure has # at the middle of the left side and ! at the bottom-right corner.

Track # through the series: bottom-right corner, middle of the right side, top-right corner, middle of the top side, top-left corner. It moves one step anticlockwise along the border each time, so it next reaches the middle of the left side.

Track !: top side, top-left corner, middle of the left side, bottom-left corner, bottom side. It also moves one step anticlockwise each time, so it next reaches the bottom-right corner.

Hence, the next figure shows # at the middle of the left side and ! at the bottom-right corner.

58. Answer: a

Explanation:

188 is correct.

Each term is obtained by doubling the previous term and adding 4.

$$2 \times 2 + 4 = 8, 8 \times 2 + 4 = 20, 20 \times 2 + 4 = 44, 44 \times 2 + 4 = 92.$$

So the next term is $92 \times 2 + 4 = 188$.

The same result follows from the differences 6, 12, 24, 48, which double each time; the next difference is 96, and $92 + 96 = 188$.

59. Answer: a

Explanation:

N is correct.

Write the alphabet positions of the letters in the first pair. B is the 2nd letter and K is the 11th letter, so K is 9 places after B: $2 + 9 = 11$.

Apply the same forward shift to E. E is the 5th letter, and moving 9 places forward gives $5 + 9 = 14$.

The 14th letter of the alphabet is N, so E pairs with N in the same way that B pairs with K.

60. Answer: b

Explanation:

A is correct: the statement is definitely true.

The passage describes Saint Nicholas as a great pastor of Myra who was famous for the good of the poor and for loving children and giving gifts to the needy.

The statement that he is popular for his love for children is therefore stated directly in the passage and does not depend on any assumption.

A fact given explicitly in the passage is definitely true, so the answer is A.

61. Answer: a

Explanation:

121 is correct.

Find the differences between consecutive terms: $19 - 2 = 17$, $53 - 19 = 34$, $70 - 53 = 17$, $104 - 70 = 34$.

The differences alternate between 17 and 34, so the next difference is 17.

Next term: $104 + 17 = 121$.

62. Answer: c

Explanation:

8 is correct.

The outer boundary is 1 square, and it is divided into four equal cells: 4 more squares.

Inside the top-left cell there are two nested squares (the thick frame and the square holding the diagonal): 2 squares. Inside the bottom-right cell there is one square around the circle: 1 square.

The diagonal and the circle form no further squares, so the total is $1 + 4 + 2 + 1 = 8$.

63. Answer: a

Explanation:

Y is correct.

Write the alphabetical position of each letter: C = 3, Q = 17, S = 19, Y = 25, E = 5.

The numbers 3, 17, 19 and 5 are all prime numbers, while $25 = 5 \times 5$ is not a prime number.

So C, Q, S and E form the group of letters at prime positions, and Y does not belong to it.

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64. Answer: b

Explanation:

A is correct.

All actors are singers and all singers are dancers, so the set of actors lies inside the set of singers, which lies inside the set of dancers.

Conclusion i: every actor is a singer and every singer is a dancer, so every actor is a dancer. It follows.

Conclusion ii: the statements only place all singers among the dancers; there may be dancers who are not singers. It does not follow.

Only conclusion i is logical.

65. Answer: a

Explanation:

O is correct.

Q and R sit at the two ends and N is fourth to the right of Q, so Q is at the left end, N is in 5th place and R is at the right end. P sits between M and O in places 2 to 4, and M is not next to N, so M is 2nd, P is 3rd and O is 4th.

The arrangement from left to right is:

Q	M	P	O	N	R
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N is in 5th place, so the person third to the left of N is M in 2nd place. The person second to the right of M is O in 4th place.

66. Answer: d

Explanation:

All follow is correct.

- i) All ants are birds and all birds are flies, so all ants are flies. It follows.
- ii) Some ants are mammals, and every ant is a bird, so those ants are birds that are also mammals: some birds are mammals. It follows.
- iii) Those same ants are also flies, so some flies are mammals. It follows.

All three conclusions follow from the statements.

67. Answer: d

Explanation:

The correct figure has a horizontal line from the middle of its left side to the centre of the circle, a vertical line from the centre down to its bottom side, and a quarter-circle at its bottom-left corner, with no diagonal.

The line from the top-left circle runs to the right and meets the missing part on its left side, so it must continue to the centre of the missing circle.

The line rising from the bottom-right circle meets the missing part on its bottom side, so it must continue up to the same centre.

The large circle is centred where the four cells meet; its fourth quarter lies in the bottom-left corner of the missing part.

No cell of the figure contains a diagonal line, so the figures with a diagonal, or with an extra vertical line and a second arc, do not fit. Hence, the figure with only the horizontal line, the vertical line and the corner quarter-circle completes the pattern.

68. Answer: c

Explanation:

The correct image is the word reversed as ADNAP, the right way up, with every letter turned left to right, including a reversed D.

The shaded line stands to the right of the word and runs from top to bottom, so it acts as a vertical mirror: left and right are interchanged, while top and bottom stay the same.

The last letter A therefore appears first and P appears last. A looks the same, while N and P are reversed, and D shows its straight stroke on the right and its curve on the left.

Two figures show the letters upright in this order, but only one of them also reverses the D. Figures with upside-down letters are not mirror images in a vertical line.

69. Answer: b

Explanation:

3,4 and 5 is correct.

Piece 1 is an oval with a curved edge and piece 2 is a pentagon with obtuse corners; neither edge can lie along a straight side or fit a right-angled corner of a square.

So every combination that contains piece 1 or piece 2 is ruled out, which removes 1,3 and 5, 1,2 and 4, and 1,3 and 4.

Pieces 3, 4 and 5 all have straight edges: the two trapeziums 4 and 5 supply the right-angled corners, and their slanted edges are closed by the triangle 3, so together they form a full square.

70. Answer: a

Explanation:

Only iii) is correct.

Combine the statements into one chain: $C < O \leq U = N > S = E \geq L$.

i) $C < E$: $C < O \leq N$, but $N > S = E$; the signs point in opposite directions, so no definite relation exists. It does not follow.

ii) $O < S$: $O \leq N$ and $N > S$ also point in opposite directions, so no definite relation exists. It does not follow.

iii) $U > E$: $U = N > S = E$, so $U > E$. It follows.

71. Answer: c

Explanation:

147 is correct.

Each term is 27 more than the previous one: $39 - 12 = 27$, $66 - 39 = 27$, $93 - 66 = 27$, $120 - 93 = 27$.

The terms form an arithmetic progression with a common difference of 27.

Next term: $120 + 27 = 147$.

72. Answer: a

Explanation:

The correct image reads C, O, Y, O, T, E in the same order, with Y and T upside down and C, O and E unchanged.

A water image is a reflection in a horizontal line below the word: top and bottom are interchanged, but left and right are not, so the letters keep their order.

C, O and E are symmetric about a horizontal line, so they look the same after the flip. Y and T are not, so both appear upside down.

A figure that inverts only Y, or only T, is incomplete, and a figure that reverses the letter order is a mirror image. Hence, the figure with both Y and T inverted is the water image.

73. Answer: b

Explanation:

RX is correct.

Check the gap between the two letters of each pair using alphabet positions: U (21) to Z (26) is +5, T (20) to Y (25) is +5, B (2) to G (7) is +5 and M (13) to R (18) is +5.

R (18) to X (24) is +6.

Four pairs follow the +5 rule, so RX does not belong to the group.

74. Answer: b

Explanation:

A is correct.

The passage describes the official Sinterklaas of the Netherlands as having almost majestic white long hair and beard.

The statement that Saint Sinterklaas had long hair and beard is therefore stated directly in the passage.

It needs no assumption or outside knowledge, so it is not merely potentially true or undeterminable: the statement is definitely true.

75. Answer: d

Explanation:

6151820 is correct.

Each letter is replaced by its position in the alphabet: B = 2, U = 21, S = 19, Y = 25, and writing these together gives 2211925.

For FORT: F = 6, O = 15, R = 18, T = 20.

Writing these numbers together gives 6151820.

76. Answer: c

Explanation:

M is exactly sitting between R and P is correct.

Q and R sit at the two ends and N is fourth to the right of Q, so Q is at the left end, N is in 5th place and R is at the right end. P sits between M and O in places 2 to 4, and M is not next to N, so M is 2nd, P is 3rd and O is 4th.

The arrangement from left to right is:

Q	M	P	O	N	R
---	---	---	---	---	---

M is in 2nd place, between Q and P, not between R and P, so this statement is false.

The other statements hold: M and P are neighbours, O sits between P and N, and N is fourth to the right of Q.

77. Answer: a

Explanation:

A is correct.

i) $S < T$: $T = O > R > S$, so $T > S$, that is, $S < T$. It follows.

ii) $C > S$: $C < T$ while $T > S$; the signs point in opposite directions, so there is no definite relation between C and S. It does not follow.

Only conclusion i is logical.

78. Answer: b

Explanation:

Maternal grandfather is correct.

B is the only daughter of C, and D is the husband of C, so D is B's father.

A is the son of B, so B is A's mother.

D is the father of A's mother, which makes D the maternal grandfather of A.

79. Answer: b

Explanation:

N is correct.

Q and R sit at the two ends and N is fourth to the right of Q, so Q is at the left end, N is in 5th place and R is at the right end. P sits between M and O in places 2 to 4, and M is not next to N, so M is 2nd, P is 3rd and O is 4th.

The arrangement from left to right is:

Q	M	P	O	N	R
---	---	---	---	---	---

O is in 4th place, and the person in 5th place, immediately to its right, is N.

80. Answer: c

Explanation:

I is correct.

The first view shows J on top, L in front and H on the right. The second view shows L on top, K in front and I on the right. G, I and K never appear with J, so the opposite face must be found from the order of faces around L.

Looking at L from outside in the first view, the faces around it in clockwise order are J (above), H (right), then the face opposite J (below) and the face opposite H (left).

Looking down at L in the second view, the faces around it in clockwise order are the back face, I (right), K (front) and the left face, so I is followed directly by K.

In the order J, H, (opposite of J), (opposite of H), I can be followed directly by K only if the face opposite J is I and the face opposite H is K. The remaining letter G is opposite L. Hence, I is on the face opposite J.

81. Answer: b

Explanation:

39 is correct.

First pair: the sum of the digits of 2011 is $2 + 0 + 1 + 1 = 4$, and $4 \times 3 = 12$.

Second pair: the sum of the digits of 2551 is $2 + 5 + 5 + 1 = 13$, and $13 \times 3 = 39$.

So the number that follows the same logic is 39.

82. Answer: d

Explanation:

8 is correct.

Count only straight lines; the two curved sides of the figure are not straight lines. A straight line that is drawn as one unbroken stroke is counted once.

Vertical lines: the long line running down from the top point, and the short line on the left of the inner shape: 2.

Horizontal lines: the top edge of the inner shape, the short piece at the bottom left and the separate short piece at the bottom right: 3.

Slanting lines: the diagonal inside the inner shape and the two sides of the V at the bottom: 3.

Total: $2 + 3 + 3 = 8$ straight lines.

83. Answer: c**Explanation:**

Stay is correct.

Transfer, migrate, shift and relocate all describe moving from one place to another.

Stay means remaining in the same place, which is the opposite idea.

So the four words about changing place form the group, and stay does not belong to it.

84. Answer: a**Explanation:**

137 is correct.

Find the differences between consecutive terms: $11 - 2 = 9$, $29 - 11 = 18$, $56 - 29 = 27$, $92 - 56 = 36$.

The differences are 9, 18, 27, 36, the successive multiples of 9, so the next difference is 45.

Next term: $92 + 45 = 137$.

85. Answer: a

Explanation:

7 is correct.

The long diagonal of the outer square cuts it into 2 right-angled triangles, with the right angles at the top-left and bottom-right corners.

The same diagonal passes through opposite corners of the two small squares and cuts each of them into 2 right-angled triangles: $2 + 2 = 4$.

The slanted line at the top-left of the inner figure closes one more triangle with the sides of the two small squares; its right angle is at the point where the two small squares meet: 1.

Total: $2 + 4 + 1 = 7$ right-angled triangles.

86. Answer: d

Explanation:

756 is correct.

When two equal distances are covered at speeds a and b , the average speed is the harmonic mean $\frac{2ab}{a+b}$.

Here $a = 630$ and $b = 945$: $\frac{2 \times 630 \times 945}{630 + 945} = \frac{1190700}{1575}$

$\frac{1190700}{1575} = 756$ mph.

87. Answer: a

Explanation:

4 is correct.

From the graph, Company X produced 43 thousand vehicles in 2001 and 47 thousand vehicles in 2002.

Difference = $47 - 43 = 4$ (thousand vehicles).

88. Answer: b

Explanation:

517 is correct.

The first part corresponds to 6 ratio units, so one unit is $\frac{282}{6} = 47$.

The whole amount corresponds to $6 + 5 = 11$ units.

Total amount: $11 \times 47 = 517$, that is, ₹517.

89. Answer: d

Explanation:

7,752 is correct.

$$\text{Simple interest} = \frac{P \times R \times T}{100} = \frac{5100 \times 13 \times 4}{100}$$

$= 51 \times 52 = 2652$, so the interest is ₹2,652.

Amount $= 5100 + 2652 = 7752$, that is, ₹7,752.

90. Answer: d

Explanation:

96 is correct.

For an average of 75 in 4 exams, the total score needed is $75 \times 4 = 300$.

Total of the first three exams: $72 + 68 + 64 = 204$.

Score needed in the fourth exam: $300 - 204 = 96$.

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91. Answer: c

Explanation:

1564 is correct.

In a rectangle the diagonal is the hypotenuse of the right triangle formed by the length and the width, so $l = \sqrt{d^2 - b^2}$.

$$l = \sqrt{598^2 - 230^2} = \sqrt{357604 - 52900} = \sqrt{304704} = 552 \text{ cm.}$$

$$\text{Perimeter} = 2(l + b) = 2(552 + 230) = 2 \times 782 = 1564 \text{ cm.}$$

92. Answer: a

Explanation:

2004 is correct.

From the graph, the gap between Company Y and Company X each year (in thousands) is: 2001: $81 - 43 = 38$; 2002: $70 - 47 = 23$; 2003: $80 - 55 = 25$; 2004: $79 - 68 = 11$; 2005: $69 - 33 = 36$; 2006: $74 - 40 = 34$.

The smallest of these gaps is 11, in 2004.

93. Answer: c

Explanation:

41 is correct.

A square root equation is solved by simplifying the known side first and then squaring both sides to remove the root.

First simplify the right side: $\sqrt{81} = 9$, so $\sqrt{40 + 9} = \sqrt{49} = 7$.

Now $\sqrt{90 - x} = 7$. Squaring both sides gives $90 - x = 49$.

Therefore $x = 90 - 49 = 41$.

94. Answer: d

Explanation:

20 is correct.

To keep the expenditure unchanged, the cut in consumption equals the rise in price divided by the new price, multiplied by 100.

Rise in price = $860 - 688 = 172$ and the new price is ₹860.

Reduction in consumption = $\frac{172}{860} \times 100 = 20\%$.

95. Answer: b

Explanation:

3450 is correct.

Selling price after a 10% discount on the marked price: $4600 \times \frac{90}{100} = 4140$, i.e. ₹4,140.

This selling price already includes a 20% profit, so it is 120% of the cost price.

Cost price = $4140 \times \frac{100}{120} = 3450$, i.e. ₹3,450.

96. Answer: b

Explanation:

94 is correct.

When sides are in a given ratio, each side is a multiple of a common factor and the sides together make up the perimeter.

Let the sides be $2k, 3k, 4k$ and $5k$. Their sum is the perimeter: $2k + 3k + 4k + 5k = 14k = 658$.

So $k = \frac{658}{14} = 47$.

The smallest side is $2k = 2 \times 47 = 94$ cm.

97. Answer: c

Explanation:

152 is correct.

Total of the 7 numbers $= 7 \times 152 = 1064$.

After one number is removed, 6 numbers remain with the same mean 152, so their total is $6 \times 152 = 912$.

Removed number $= 1064 - 912 = 152$. Removing a value equal to the mean leaves the mean unchanged.

98. Answer: b

Explanation:

21,175 is correct.

Under compound interest the interest of each year is added to the principal, so the second year earns interest on the first year's interest too.

Amount under compound interest: $A = P \left(1 + \frac{r}{100}\right)^n$.

$$A = 17500 \times \left(1 + \frac{10}{100}\right)^2 = 17500 \times 1.21.$$

$$A = 21175, \text{ i.e. ₹21,175.}$$

99. Answer: c

Explanation:

25 is correct.

The cost price is ₹240 and the selling price is ₹300; since the selling price is higher, the deal gives a profit.

$$\text{Profit} = 300 - 240 = 60, \text{ i.e. ₹60.}$$

Gain is always expressed as a percent of the cost price.

$$\text{Profit percent} = \frac{60}{240} \times 100 = 25\%.$$

100. Answer: a

Explanation:

121 is correct.

$$\text{Total weight of the 11 players} = 11 \times 109 = 1199 \text{ kg.}$$

With the coach there are 12 members and the mean becomes $109 + 1 = 110$ kg, so the new total is $12 \times 110 = 1320$ kg.

$$\text{Weight of the coach} = 1320 - 1199 = 121 \text{ kg.}$$

101. Answer: c

Explanation:

70 is correct.

A percentage compares a part with the whole: $(\text{part} \div \text{whole}) \times 100$. Here the whole is the original 120 soaps.

$$\text{Soaps left in the box} = 120 - 36 = 84.$$

Share left as a percent of the original 120 soaps = $\frac{84}{120} \times 100 = 70\%$.

102. Answer: b

Explanation:

$2916\sqrt{3}$ is correct.

An equilateral triangle has all three sides equal and every angle equal to 60° , and its height is $\sqrt{3}/2$ times the side.

Area of an equilateral triangle of side a is $\frac{\sqrt{3}}{4}a^2$.

$$\frac{\sqrt{3}}{4} \times 108^2 = \frac{\sqrt{3}}{4} \times 11664 = 2916\sqrt{3} \text{ cm}^2.$$

103. Answer: b

Explanation:

20 is correct.

The cost price is ₹435 and the selling price is ₹348; since the selling price is lower, the deal results in a loss.

$$\text{Loss} = 435 - 348 = 87, \text{ i.e. ₹87.}$$

Loss is expressed as a percent of the cost price.

$$\text{Loss percent} = \frac{87}{435} \times 100 = 20\%.$$

104. Answer: c

Explanation:

25444 is correct.

Write each percent as a fraction: $25\% = \frac{1}{4}$, $66.67\% = \frac{2}{3}$, $75\% = \frac{3}{4}$, $80\% = \frac{4}{5}$.

Their product is $\frac{1}{4} \times \frac{2}{3} \times \frac{3}{4} \times \frac{4}{5} = \frac{1}{10}$, so $\frac{N}{10} = 6361$ and $N = 63610$.

40% of the number $= 63610 \times \frac{40}{100} = 25444$.

105. Answer: a

Explanation:

462 is correct.

To pass the signal the train covers only its own length L : $L = 42s$, where s is its speed in m/s.

To cross the bridge it covers its length plus the bridge: $L + 473 = 85s$.

Subtracting, $43s = 473$, so $s = 11$ m/s and $L = 42 \times 11 = 462$ m.

106. Answer: d

Explanation:

7 is correct.

This works because 10 leaves remainder 1 on division by 9, so every power of 10 also leaves remainder 1.

A number leaves the same remainder on division by 9 as the sum of its digits.

Sum of digits $= 9 + 7 + 5 + 3 + 1 = 25$.

$25 = 2 \times 9 + 7$, so the remainder is 7.

107. Answer: c

Explanation:

4 is correct.

Each inner root here is a perfect square, so the expression collapses one layer at a time.

Work from the innermost root outward: $\sqrt{1024} = 32$, then $\sqrt{193 + 32} = \sqrt{225} = 15$.

Next $\sqrt{34 + 15} = \sqrt{49} = 7$.

Finally $\sqrt{9 + 7} = \sqrt{16} = 4$.

108. Answer: a

Explanation:

819 is correct.

Distance = speed $\times$ time; the speed is already in m/s and the time in seconds, so the length comes out directly in metres.

When a train passes a signal (a point object), the distance it covers equals its own length.

Length = speed $\times$ time = $63 \times 13 = 819$ m.

109. Answer: c

Explanation:

5356 is correct.

A rhombus has four equal sides, and its two diagonals split it into four congruent right triangles.

The diagonals of a rhombus bisect each other at right angles, so its area $= \frac{1}{2} \times d_1 \times d_2$.

$$\frac{1}{2} \times 103 \times 104 = 103 \times 52 = 5356 \text{ cm}^2.$$

110. Answer: d**Explanation:**

-322 is correct.

Follow BODMAS: brackets from the innermost outward, and inside each bracket division before subtraction.

Innermost bracket first: $300 \div 12 = 25$ and $35 - 25 = 10$.

Then $10 \div 10 = 1$ and $90 \div 10 - 1 = 9 - 1 = 8$.

Next $450 - 8 = 442$, and finally $120 - 442 = -322$.

111. Answer: b**Explanation:**

361 is correct.

Numerator: $19 \times 30 \times 19 \times 30 = (19 \times 30)^2 = 570^2$.

Denominator: $\sqrt{900} = 30$, $30 \div 2 = 15$, $2 \times 15 = 30$ and $30^2 = 900$.

$$\frac{570^2}{30^2} = \left(\frac{570}{30}\right)^2 = 19^2 = 361.$$

112. Answer: d

Explanation:

10,100 is correct.

Simple interest $SI = \frac{P \times R \times T}{100}$, so $P = \frac{SI \times 100}{R \times T}$.

$$P = \frac{6060 \times 100}{12 \times 5} = \frac{606000}{60} = 10100, \text{ i.e. ₹10,100.}$$

113. Answer: a

Explanation:

126 is correct.

When two quantities are in the ratio 2 : 5, they can be written as 2 and 5 parts of a common unit.

Let the ages be $2k$ and $5k$. Their sum gives $7k = 294$, so $k = 42$.

Difference of ages = $5k - 2k = 3k = 3 \times 42 = 126$.

114. Answer: d

Explanation:

20 is correct.

Percentage increase = (increase $\div$ original value) $\times$ 100.

Increase in price = $486 - 405 = 81$, i.e. ₹81.

The rise is measured on the original price of ₹405.

Percent increase = $\frac{81}{405} \times 100 = 20\%$.

115. Answer: b

Explanation:

22 is correct.

For any two numbers, the product of the numbers equals the product of their LCM and HCF.

Other number = $\frac{132 \times 22}{132} = 22$.

Check: 22 divides 132, so the HCF of 132 and 22 is 22 and their LCM is 132.

116. Answer: a

Explanation:

135 is correct.

Let the numbers of pens, pencils and rubbers be $3k$, $2k$ and k .

Total cost = $3 \times 3k + 2 \times 2k + 2 \times k = 9k + 4k + 2k = 15k$, and $15k = 675$ gives $k = 45$.

Number of pens = $3k = 3 \times 45 = 135$.

117. Answer: c

Explanation:

652/900 is correct.

In $0.72\overline{4}$ the digits 7 and 2 do not repeat, while 4 repeats.

For such a mixed recurring decimal, take the whole digit string minus the non-repeating part, over one 9 for each repeating digit followed by one 0 for each non-repeating digit.

$$X = \frac{724 - 72}{900} = \frac{652}{900}.$$

118. Answer: d

Explanation:

74355 is correct.

A number is divisible by 15 when it is divisible by both 3 and 5.

All four numbers end in 5, so each is divisible by 5. Digit sums: 74255 $\rightarrow$ 23, 74345 $\rightarrow$ 23, 74365 $\rightarrow$ 25, 74355 $\rightarrow$ 24.

Only 24 is a multiple of 3, so 74355 is divisible by 15 ($74355 = 15 \times 4957$).

119. Answer: b

Explanation:

167 is correct.

Total production of Company X (in thousands) = $43 + 47 + 55 + 68 + 33 + 40 = 286$.

Total production of Company Y (in thousands) = $81 + 70 + 80 + 79 + 69 + 74 = 453$.

Difference = $453 - 286 = 167$ (thousand vehicles).

120. Answer: d

Explanation:

640 is correct.

Cost price = selling price $\times 100 \div (100 - \text{loss } \%)$.

A 15% loss means the selling price is 85% of the cost price.

Cost price = $544 \times \frac{100}{85} = 640$, i.e. ₹640.

Check: 15% of ₹640 is ₹96, and $640 - 96 = 544$.

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