

ANSWER **Part A - Individual Questions Part 1 of 2 ** ANSWERS

Grade 6

Name: _____.

1.) Calculate: Calculate $4 + 16 - 7 + 41 - 26$

Answer:

28

2.) What is 78.628 rounded to the nearest whole number?

Answer:

79

3.) Calculate the sum of the following mixed fractions:

$$1\frac{1}{3} + 4\frac{2}{3}$$

Answer:

6

4.) Safety Factor = $\frac{\text{Maximum load a structure can support before breaking}}{\text{Actual load that a structure is designed to support}}$

Calculate the safety factor if the maximum load is 60 kg and the actual load is 40 kg.

Answer:

1.5

5.) Find the answer for F_f where: $F_f = \mu m g$

$$\mu = 0.55$$

$$m = 10 \text{ kg}$$

$$g = 9.81 \text{ m/s}^2$$

Where:

F = Force due to friction (units of Newtons (N))

μ = co-efficient of friction

m = mass (units of kilograms, kg)

g = constant (acceleration due to earth's gravity, 9.81 m/s^2)

Answer:

53.955 N

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6.) Simplify the expression: $4(9 + 6r)$

Answer:

$$36 + 24r$$

7.) What is the next number in the sequence? 12, 24, 36, 48, ?

Answer:

60

8.) The **air** in our atmosphere is composed of molecules of different gases.

By volume, the composition of air is

78% nitrogen

21% oxygen

?% other gases including argon, carbon dioxide and others

What is the % composition of other gases?

Answer:

1%

9.) One of the most widely used types of stainless steel is known as “Stainless Steel 18-8” since its composition is 18% chromium and 8% nickel.

Write 8% as a fraction (make sure to reduce the fraction)

Answer:

2/25

10.) The 2014 Porsche 911 has the following specifications:

350 horsepower

289 km/hr top speed

4.8 seconds 0 to 100 km/hr

64 liters fuel tank capacity

Average fuel consumption = 9.1 liters of fuel used for every 100 km of driving.

Mass 1815 kg

Price \$96,200

If the average car has about 142 horsepower, what percent more horsepower does a Porsche 911 have compared to the average car?

Answer: *

 208 hp (half marks)
 146% more (full mk)

11.) If

$$x = 4$$

Then evaluate the following expression:

$$5x + 2$$

Answer:

22

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- 12.) A type of glass used to make optical lenses is called BK-7. It has an index of refraction of 1.5

Write in the index of refraction of BK-7 as a fraction.

Answer: * 3/2 (half marks) 1 1/2 (full marks)

- 13.) Ohm's law is one of the most important principles used in Electrical Engineering. Ohm's law states that the current through a conductor between two points is directly proportional to the potential difference across the two points as described in equation below:

I is the current through the conductor in units of amps (A)

V is the voltage measured across the conductor in units of volts (V)

R is the resistance of the conductor in units of ohms (Ω)

$$I = \frac{V}{R}$$

What is current flow through a circuit if the voltage is 12V and resistance is 3Ω ?

Answer: 4 ohms

- 14.) Electrical Energy is the capacity to do work.

Electrical energy is the product of power multiplied by the length of time it was consumed.

Energy = power x time

Power = voltage x current or more simply written as $P = V \times I$

Where Energy has the unit of in joule (J)

P is power in unit of watts (W)

Time has the unit of second (s)

Calculate the energy consumed by a motor that uses 100 Watts of power and runs for 10 seconds?

Answer: 1000 J

- 15.) Calculate the following: -1^3

Remember:

$-1 \times -1 = +1$

$+1 \times -1 = -1$

Answer: -1

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- 16.) If the Prince Edward Viaduct was constructed 6 years earlier than Lasalle Causeway and Lasalle Causeway was constructed 3 years later after the Leaside Bridge.

How many years apart between when the Prince Edward Viaduct and the Leaside Bridge were built?

Answer: * 3 yrs

- 17.) The Environmental Engineer conducted two test pits, each with an area of 25m^2 , to collect soil samples for chemical analysis. If the test pits are placed side by side to form a larger rectangular excavation pit.

What will be the working total of the excavated area?

Answer: 50 m^2
