

Directed Numbers

Addition and Subtraction

- a) $A + B = A + B$
- b) $-A + B = -A + B$
- c) $A + (-B) = A - B$
- d) $A - (-B) = A + B$

Example:

- a) $10 + (-3) = 10 - 3 = 7$
- b) $10 - (-3) = 10 + 3 = 13$

Multiply

- a) $A \times B = AB$
- b) $-A \times B = -AB$
- c) $A \times (-B) = -AB$
- d) $-A \times (-B) = AB$

Example:

- a) $10 \times (-3) = -30$
- b) $-3 \times (-4) = 12$

Divide

- a) $A \div B = \frac{A}{B}$
- b) $-A \div B = -\frac{A}{B}$
- c) $A \div (-B) = -\frac{A}{B}$
- d) $-A \div (-B) = \frac{A}{B}$

Rule for Multiply and Divide

It is important to follow the multiplication rule to solve many types of questions including the

- a) Fraction
- b) Decimal

Example

$$-\frac{1}{3} \times \left(-\frac{2}{5}\right) = \frac{2}{15}$$

Questions on Directed Numbers

Solve the following equation

1. $23 + (-5)$
2. $23 - (-5)$
3. $-23 + (-5)$
4. $-23 - (-5) + 20$
5. $20 - (-23) + (-10)$
6. $120 - (-20) - 50$
7. $100 - (-230) + 50$
8. $120 - (-20) - (-50)$

Solve the following equation below

1. $2 \times (-10)$
2. $-3 \times (-50)$
3. $-5 \times 10 \times 3 \times (-4)$
4. $120 \times (-20) \times 6$
5. $13 \times (-20) \times 6$
6. $-3 \times 20 \times (-6)$

Solve the following equation below

1. $4 + 6 - 2 \times (-10)$
2. $10 - (-4) - 3 \times (-50)$
3. $6 + 4 - 5 \times 10 \times 3 \times (-4)$
4. $120 \times (-20) \times (6 + 10)$
5. $13 \times (-20) \times (6 - (-2))$
6. $10 - 3 \times 20 \times (-6)$

Solve the following equation

1. $4 + (-3) \times 5 - (-13)$
2. $[4 + (-3)] \times [5 - (-13)]$
3. $4 + (-3) \times [5 - (-13)]$
4. $[4 + (-3) \times 5] - (-13)$
5. $6 - (-3) \times (-6) - (-13)$
6. $[6 - (-3)] \times (-6) - (-13)$
7. $6 - (-3) \times (-6) + (-13)$

Example:

Try this trivia question. James starts moving a box 3m to his left. Jackie moves it 2m back to the right. Gina who is the youngest in the family then moves the box x meters to the right. If the last location of the box is 7meters to the right of James, how far does Gina moves the box?

Sol:

Assume Left is (-) and right is (+)

$$(+7m) = (-3m) + (+2) + x$$

$$x = (-1) + (+7m)$$

$$= (+6m)$$

Gina moves the box 6meters to the right

Example:

A Denser Probe II has been launched into the ocean to investigate the sodium concentration at different sea depth. The probe was lowered 1230m below the sea level for the first data collection before rising up 150m for the second data collection. What is the distance of the probe to the sea level during the second data collection?

Sol:

$$\text{Distance} = 1230m + (-150m) = 1080m$$

Example:

Jerry collected \$25.00 from Jack and \$27.50 from Trish this month. He plans to return Ned and Jane each \$15.00 for helping him to purchase some magazines last month. How much money is left in Jerry's pocket after the transaction?

Sol:

$$\begin{aligned} \text{Money left} &= \$25.00 + \$27.50 + (-\$15.00) + (-\$15.00) \\ &= \$22.50 \end{aligned}$$

Questions

Questions

Fresh graduate who is planning to work outstation will face one of the biggest challenges in their life. A fresh grad needs to plan well his expenditure in-order to avoid financial difficulties. Tom, a fresh grad majoring Computer Science earns \$2500 a month. He needs to pay his car loan \$300, fuel \$300 and rental \$650 monthly? How much is left after the income deduction?

Sol:

$$\begin{aligned} \text{Money left} &= \$2500 + (-\$300) + (-\$300) + (-\$650) \\ &= \$1250 \end{aligned}$$

Example:

A whole chocolate cake has a weight of 2k. Brian took 0.75kg while Vicky took another 0.35 kg. How much weight is left from the whole cake ?

Sol:

$$\begin{aligned} \text{Weight left} &= 2\text{kg} + (-0.75\text{kg}) + (-0.35\text{kg}) \\ &= 0.9\text{kg left} \end{aligned}$$

Example:

The price of the share for ABC is \$23.75 at 9.30am. At 10.30am the price of ABC shot up by 40cents which is an increase of 1.68%. At the evening 4.00pm, the price drop 15cents due to major force selling. How much is the value of the share at 4.00pm?

Questions

An oil barrel has 3 liters of oil. If James and Trish used 0.7liter each, how much oil is left in the barrel.

Questions

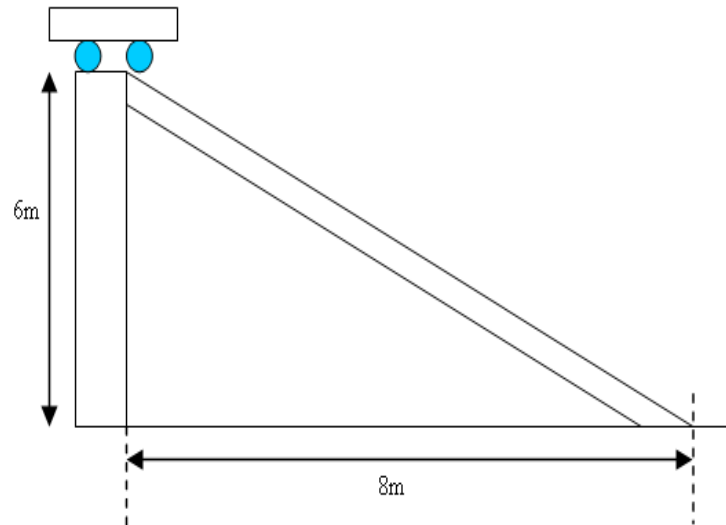
A submarine is traveling towards the surface with a speed of 20ms^{-1} . If the submarine is located 1.5km beneath the sea level. Find the new position after 5 seconds.

Questions:

A hot air balloon is at the height of 50 000m above the ground. If the balloon starts to fall at the speed of -17ms^{-1} . Find the height of the balloon after 30minutes.

Questions:

The trolley is placed on a ramp at 6 meters above the ground. If the trolley is led to slide from the ramp at the speed of 1ms^{-1} , what would be the height of the ramp reference to the ground after 3 seconds?



Question:

A glass of water at room temperature 27°C was left in the freezer. After 35 minutes exposed to the cold environment, it turned into solid ice 0°C . What is the average change in the temperature for a second?

Question:

An aquarium has the dimension of 30cm x 300cm x 30cm. Andy fills up the aquarium with water using a hose connected to the water source. Assuming there is a leakage at the bottom of the aquarium, which allows $13\text{cm}^3\text{s}^{-1}$ of water to leak from the aquarium. How long Andy needs to wait for the hose to fill up the empty aquarium till it reaches the maximum volume? (Rate for the volume respected to time exerts by the hose $20\text{cm}^3\text{s}^{-1}$).