Applying straight line graphs to solve problems

Mana Maths

Te reo Māori terms

kauwhata
graph
Open in Te Aka

rōnaki
gradient
Open in Te Aka

haukotinga y
y-intercept
Open in Te Aka

whārite
equation
Open in Te Aka

Applying straight line graphs to solve problems — Foundation

Use the straight-line rule or table to answer each question.

1. A movie ticket graph has rule $C = 5n + 2$, where n is the number of tickets. Find the cost when $n = 4$.

2. A taxi fare graph has rule $F = 2d + 6$, where d is distance in km. Find the fare for 7 km.

3. A savings graph has rule $S = 10w + 5$, where w is weeks. How much is saved after 6 weeks?

4. A candle height graph has rule $h = 16 - 2t$, where t is time in hours. Find the height after 3 hours.

5. A water tank graph has rule $V = 2t + 3$, where t is time in minutes. Find the water volume after 8 minutes.

6. A walking graph has rule $d = 0.4t + 0.5$, where t is time in minutes. Find the distance after 5 minutes.

7. For the graph $C = 5n + 2$, what does the $+2$ mean in the context of movie tickets?

8. For the graph $F = 2d + 6$, what does the gradient 2 mean in the context of the taxi fare?

9. The rule for a plant graph is $h = 3w + 10$. What is the starting height of the plant?

10. The graph rule is $B = 92 - 8t$, where B is battery percentage. How much battery is left after 4 hours?

11. The graph rule is $h = 30 - 3t$, where h is water height in cm. After how many hours will the height be 18 cm?

12. The graph rule is $C = 4t + 8$, where t is bike-hire time in hours. How much does 5 hours cost?

Applying straight line graphs to solve problems — Proficient

Use straight-line rules to interpret, predict, and solve context problems.

1. A bike-hire graph has rule $C = 4t + 8$. Find the cost for 6 hours, then state the fixed charge.

2. A phone battery graph has rule $B = 92 - 8t$. Find the battery percentage after 7 hours.

3. A plant growth graph has rule $h = 3w + 10$. In which week will the plant reach 25 cm?

4. A tank drains according to $V = 30 - 3t$. Find when the tank will be empty.

5. Courier A has graph $C = 5p + 4$, where p is the number of parcels. Find the cost for 6 parcels.

6. Courier B has graph $C = 3p + 12$. Find the cost for 6 parcels.

7. Using Courier A and Courier B, which company is cheaper for 2 parcels? Show the two costs.

8. Using Courier A and Courier B, which company is cheaper for 8 parcels? Show the two costs.

9. A temperature graph is $T = 5m + 10$, where m is minutes. Find the temperature after 9 minutes.

10. A snow-depth graph is $d = 4h + 6$. Find the depth after 5 hours, then explain what the $+6$ means.

11. A school van trip costs $C = 6k + 12$, where k is distance in km. Find the total cost for 9 km.

12. A different van trip costs $C = 8k + 4$. Compare the two van costs for 4 km and decide which is cheaper.

Applying straight line graphs to solve problems — Excellence

Use straight-line models to compare options, find intersections, and justify decisions.

1. Gym Plan A has graph $C = 4v + 10$. Find the cost for 8 visits.

2. Gym Plan B has graph $C = 2v + 26$. Find the cost for 8 visits.

3. Using Gym Plan A and Gym Plan B, which plan is cheaper for 3 visits?

4. Using Gym Plan A and Gym Plan B, which plan is cheaper for 10 visits?

5. Solve $4v + 10 = 2v + 26$ to find the number of visits where the two gym graphs intersect.

6. Explain what the intersection of the two gym graphs means in this context.

7. A tank empties with rule $V = 48 - 4t$. Find the water volume after 7 minutes.

8. Using $V = 48 - 4t$, find when the tank reaches 12 L.

9. A heating graph is $T = 5m +$ Find when the temperature reaches $55℃$.

10. A van trip has graph $C = 6k + 12$. Another has graph $C = 8k + 4$. Find both costs for 5 km.

11. Solve $6k + 12 = 8k + 4$ to find where the two van-cost graphs intersect.

12. For short trips, which van option is cheaper? Use the intersection to justify your answer.

13. A snow-depth graph is $d = 4h + 6$. Find how long it takes for the depth to reach 30 cm.

14. A student says the graph $C = 3p + 12$ is always more expensive than $C = 5p + 4$. Is the student correct? Use values or an equation to justify your answer.