

③ $h(x) = \underline{112}$

$h(x) = 3(x-3)^2 + 4$

$\underline{112} = 3(x-3)^2 + 4$

$\frac{108}{3} = \frac{3(x-3)^2}{3}$

$\sqrt{36} = \sqrt{(x-3)^2}$

$\pm 6 = x-3$

$6 = x-3$	$-6 = x-3$
$9 = x$	$-3 = x$

$\underline{3} + \underline{-9} = -6$

$\underline{3}x - \underline{9} = -27$

-27

$1x - 27$

$3x - 9$

③ $h(x) = \underline{112}$

$h(x) = 3(x-3)^2 + 4$

$\underline{112} = 3(x-3)^2 + 4$

$\frac{108}{3} = \frac{3(x-3)^2}{3}$

$36 = (x-3)^2$

$36 = (x-3)(x-3)$

$36 = x^2 - 3x - 3x + 9$

$36 = x^2 - 6x + 9$

$0 = x^2 - 6x - 27$

$0 = (x+3)(x-9)$

$x+3=0 \quad | \quad x-9=0$

$x=-3 \quad | \quad x=9$

Warm-Up

$l = 28.5 \text{ cm}$

The height in centimetres is a function of the length, "l" in centimetres, of the humerus (the upper arm bone).

For a female: $f(l) = 2.754(l) + 71.475$

For a male: $m(l) = 2.894(l) + 70.641$



a) Determine each value. What does each number represent?

i) $f(15)$

ii) $m(20)$

(i) $f(15)$

$$f(l) = 2.754l + 71.475$$

$$f(15) = 2.754(15) + 71.475$$

$$f(15) = 41.31 + 71.475$$

$$f(15) = 112.785 \text{ cm}$$

length of her
humerus
bone

the girl's
height

(ii) $m(20)$

$$m(l) = 2.894(l) + 70.641$$

$$m(20) = 2.894(20) + 70.641$$

$$m(20) = 57.88 + 70.641$$

$$m(20) = 128.521 \text{ cm}$$

length of
his humerus
bone

the boy's
height

Warm-Up

The height in centimetres is a function of the length, "l" in centimetres, of the humerus (the upper arm bone).

For a female: $f(l) = 2.754(l) + 71.475$

For a male: $m(l) = 2.894(l) + 70.641$

b) Determine each value of l . What does each number represent?

i) $f(l) = 142$ ii) $m(l) = 194$

(i) $f(l) = \underline{142}$ ← her height

$$\underline{f(l)} = 2.754l + 71.475$$

$$\underline{142} = 2.754l + \underline{71.475}$$

$$\frac{70.525}{2.754} = \frac{2.754l}{2.754}$$

$$25.608 \text{ cm} = l$$

↑
the length of her humerus bone.

(ii) $m(l) = \underline{194}$ ← his height

$$\underline{m(l)} = 2.894l + 70.641$$

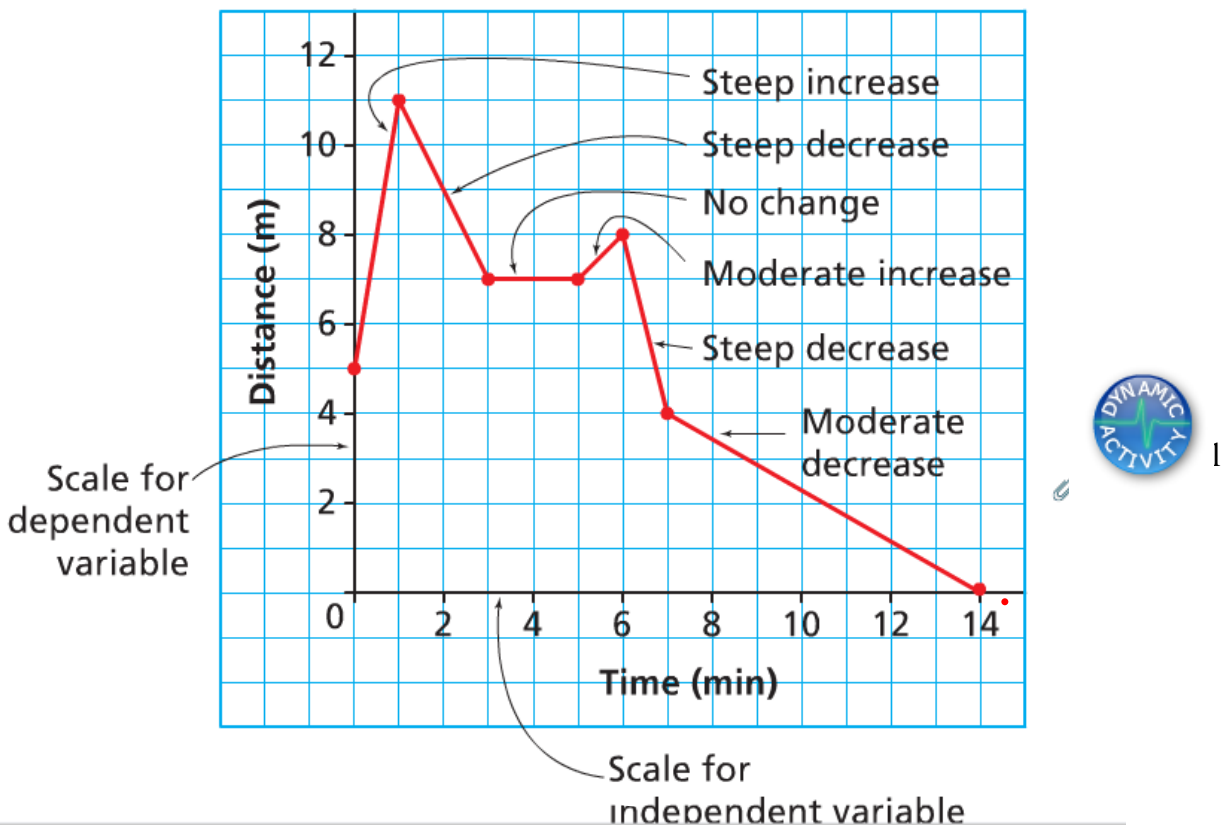
$$\underline{194} = 2.894l + 70.641$$

$$\frac{123.359}{2.894} = \frac{2.894l}{2.894}$$

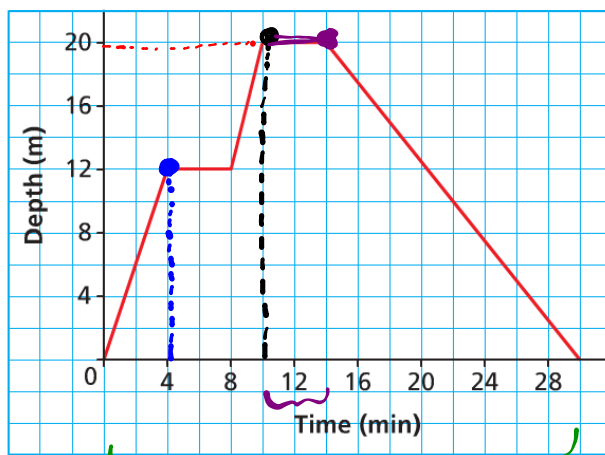
$$42.626 \text{ cm} = l$$

↑
the length of his humerus bone

Interpreting & Sketching Graphs



A Scuba Diver's Dive



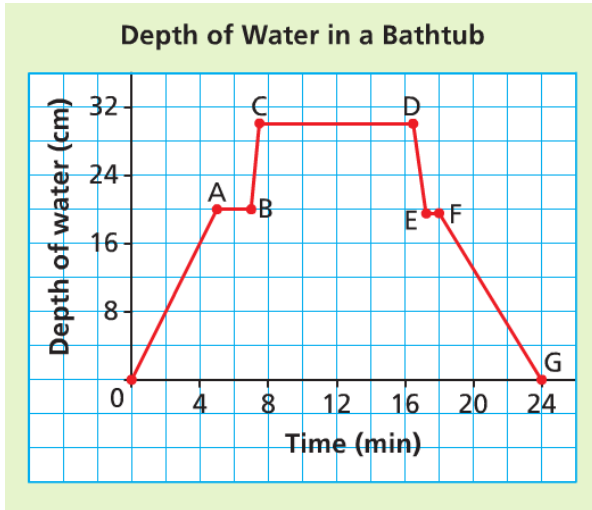
Graphs provide much information !!

How many minutes did the dive last? 30 minutes

At what times did the diver stop her descent? 4 mins + 10 mins

What was the greatest depth the diver reached? 20m

For how many minutes was the diver at that depth? 4 mins



What does segment OA represent?

Filling up the tub for 5 min to a depth of 20cm.

What does segment AB represent?

The water was turned off.

What does segment BC represent?

2 min later the person got into the tub.

What does segment CD represent?

The person stayed in the tub for approximately 9 min.

What does segment DE represent?

The person got out of the tub.

What does segment EF represent?

The person dried off.

What does segment FG represent?

The person pulled the plug, and it took 6 min for the tub to drain

Try This!

a) Which bag is the most expensive?
 What does it cost? C (\$7.00)

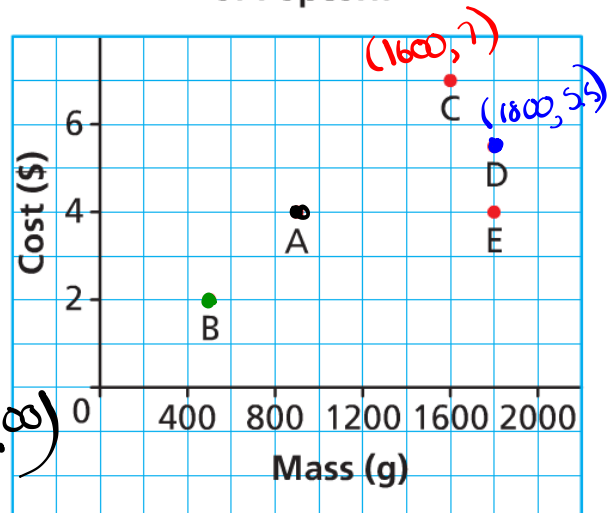
b) Which bag has the least mass?
 What is this mass? B (500g)

c) Which bags have the same mass?
 What is this mass? D + E (1800g)

d) Which bags cost the same?
 What is this cost? A + E (\$4.00)

e) Which of bags C or D has the better value for money? D

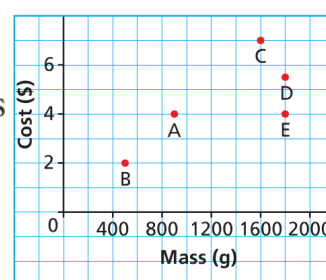
Costs and Masses of Various Bags of Popcorn



SOLUTION

- a) Bag C is most expensive because it is represented by the highest point on the graph and the vertical axis represents cost. It costs \$7.00.
- b) Bag B has the least mass because it is represented by the point on the graph farthest to the left and the horizontal axis represents mass. The mass appears to be 500 g.
- c) Bags D and E have the same mass because the points that represent them lie on the same vertical line and it passes through 1800 on the *Mass* axis. The mass is 1800 g.
- d) Bags A and E cost the same because the points that represent them lie on the same horizontal line and it passes through 4 on the *Cost* axis. The cost is \$4.00.
- e) Bag D has the better value for money because it has a greater mass than bag C and costs less than bag C.

Costs and Masses of Various Bags of Popcorn

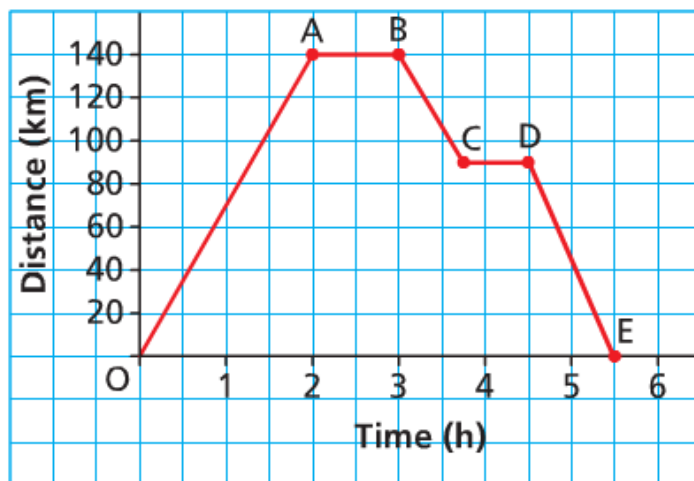


Try This!

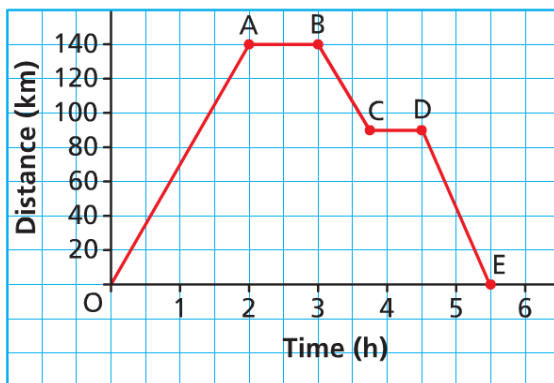
This graph represents a day trip from Athabasca to Kikino in Alberta, a distance of approximately 140 km.

Describe the journey for each segment of the graph.

Day Trip from Athabasca to Kikino



Day Trip from Athabasca to Kikino



[Answer: The car takes 2 h to travel 140 km to Kikino; the car stops for 1 h; the car takes approximately 45 min to travel 50 km toward Athabasca; the car stops for approximately 45 min; the car takes 1 h to travel approximately 90 km to Athabasca]

Check out pages 281 and 282

#3, 4, 5, 6, 7, 11