1. The height of a triangle is 4 more than twice its base. The area of the triangle is 168 square inches. Find the height of the triangle.

$2x+4$, x

$A = \frac{bh}{2}$

$168 = \frac{x(2x+4)}{2}$

$\frac{2x^2+4x}{2}$

$0 = x^2 + 2x - 168$

$0 = (x-12)(x+14)$

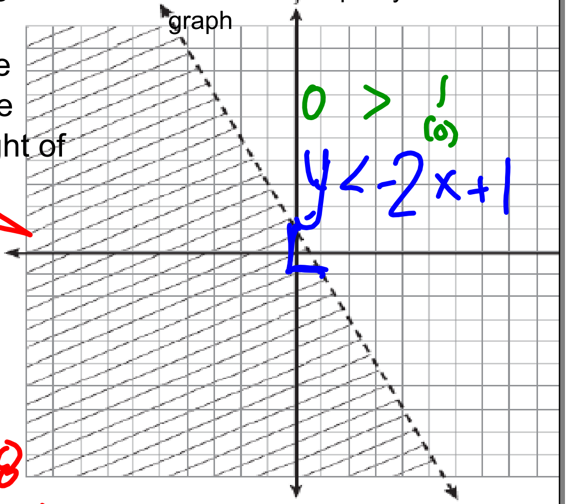
$x = 12$ $\quad$ $\cancel{x = -14}$

$2x+4$

$2(12)+4$

28 in

2. Write an inequality for the graph



$0 > 1$
(0)

$y < -2x + 1$

Calculating the Average Rate of Change

As stated on the previous slide, we calculate the average rate of change of the height of the ball by taking the difference in heights of the ball at the two points divided by the difference in times.

If you haven't found that value so far, please do it now and enter it below. In this instance, we want to examine the average rate of change for (0.5 sec , 6.275 meters) to (1 sec , 8.6 meters).

Your computation should look something like this:

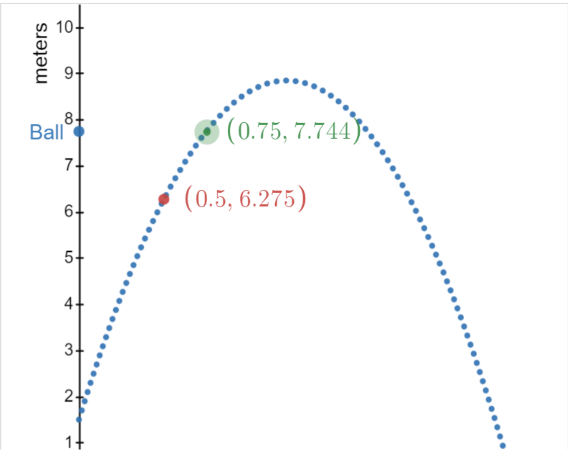
$$\frac{height_2 - height_1}{time_2 - time_1}.$$

$$\boxed{\frac{8.6 - 6.275}{1 - .5}}$$

4.65

STUDENT SCREEN PREVIEW 5 of 13

Time for some mathematical analysis!



Calculate the average rate of change in the graph from time $t = 0.5$ to $t = 0.75$. Include units on your final answer.

5.876

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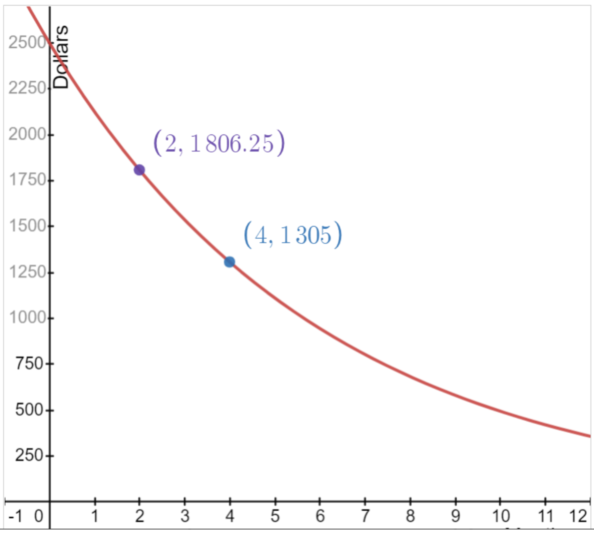
STUDENT SCREEN PREVIEW 7 of 13



The graph at the right shows the average balance in M James' checking account over a 12 month period.

Find the average rate of change in the amount of mon in my checking account from month 2 to month 4. Include units in your final answer.

$\$ -250.63\ per\ month$

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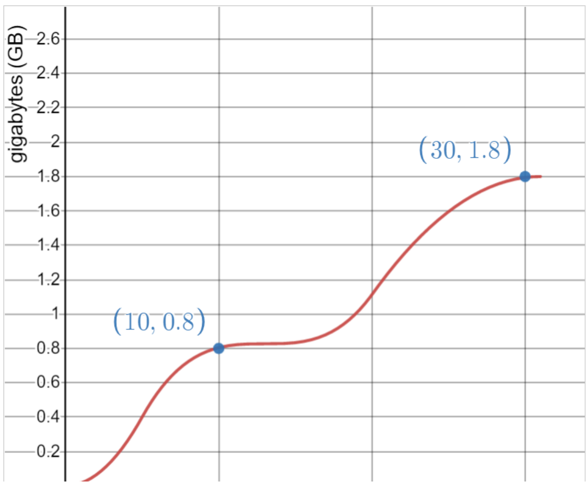
STUDENT SCREEN PREVIEW 10 of 13

Cell Phone Usage per Month



The graph at the left shows the typical data usage of a cell phone (in gigabytes) over a month.

Using the graph, estimate the average rate of change in the piecewise function from $t = 10$ to $t = 30$. Include units on your answer.

0.05GB/month

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STUDENT SCREEN PREVIEW 11 of 13 Next

Emptying the Pool!

Water Removal Rates

t (hours)	0	1	3	6	8
$R(t)$ (gallons/~~hour~~)	335	298	237	185	175

I think this is supposed to be just gallons

The pool at the local YMCA needs to be emptied for maintenance work.
The table at the left shows how fast water is being pumped out of the pool at certain times.

Find the average rate of change from time $t = 1$ to $t = 8$. Include units on your final answer.

$-\frac{17.6 gallons}{hr}$

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Average Rates of Change for an Analytic Function

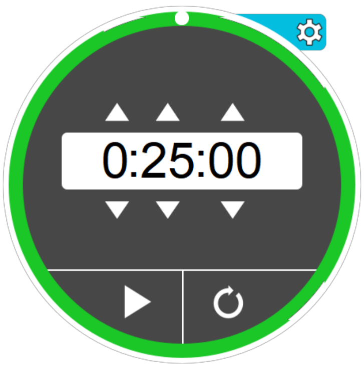
Finally, consider how would you find the average rate of change if you were given only the function and not a graph (or coordinates).

Find the average rate of change for $f(x) = x^2 + 3$ from $x = 2$ to $x = 5$.
(Are there any units on your answer?)

(2, 7) (5, 28)
Rate of change is 7 (no units)

$\frac{21}{3} = 7$

Geometry, Stats, and Sequences WS



Finish early? Do the back of the worksheet

Geometry, Stats, & Seq.

① D

② B (plug in (3, 8))

③ A - T

B - $\frac{10}{27}$ = 37% F

C $\frac{7}{12}$ = 58% T

D $\frac{27}{56}$ = 48% T

B

④ E .05(80) = 4 F

F. .35(80) = 28 T

G. .9(80) = 72 F

F

⑤ STAT → CALC → 4

$y = .73x + 56.9$

40 86.1 ✓

10 64.2 ×

30 71.5 ×

65 104.35 ×

42 87.56 ×

$\frac{1}{5}$ 20%

A

40 99 9.3

10 60 -3.9

$\frac{1}{5}$

⑥ B

⑦ A - T

B - T

C - F

D T

C

A(-1, 3)

B(3, 1)

⑧ AB $\sqrt{(3+1)^2+(1-3)^2}$ BC $\sqrt{(1-3)^2+(-3-1)^2}$ AC $\sqrt{(1-1)^2+(-3-3)^2}$

$\sqrt{20} + \sqrt{20} + \sqrt{40}$

$\sqrt{4^2+2^2}$ ≈ 15.23

A

⑨ B(2, 6) E(4, 0)

$\sqrt{(2-4)^2+(6-0)^2}$

$\sqrt{4+36}$

$\sqrt{40}$

6.3

C

⑩ $16x^2-1$

$(4x+1)(4x-1)$

A

⑪ $V = \pi r^2 h$

$= 3.14(4)^2(10)$

$= 502.4$

B

Complete page 7