LESSON MAKER PRO

Model the Moment

Use linear models to make predictions from data.

HIGH SCHOOL · GDA.DSP.F.15.a

GDA.DSP.F.15.a "Use the linear model to solve problems in the context of the given data."

NAME _____ DATE _____

USING A LINEAR MODEL

In a linear model, y = mx + b, the value of y is a prediction based on x. Substitute a value for x to predict y. To find when a target will be reached, substitute the target for y and solve for x.

WORKED EXAMPLE

An art studio charges a $17 entry fee plus $13 per hour. The model y = 13x + 17 predicts the total cost y, in dollars, for x hours. Predict the cost for 4 hours.

1. Substitute x = 4: y = 13(4) + 17.
2. Multiply: y = 52 + 17.
3. Add: y = 69.

Answer: $69

PRACTICE 6 problems

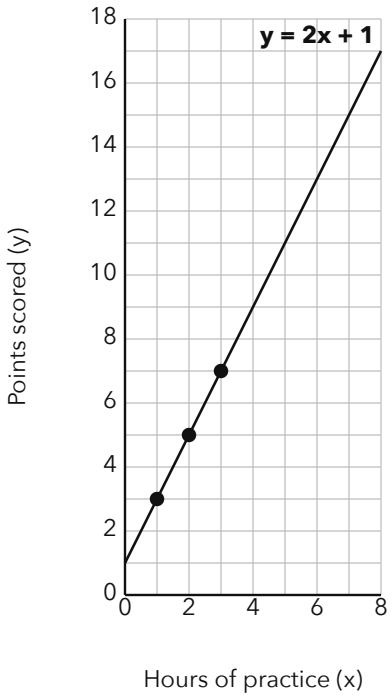
1 The table shows water in a tank as it fills. The linear model is y = 3x + 5, where x is minutes and y is liters. How many liters does the model predict after 6 minutes?

WATER IN THE TANK

Minutes (x)	Liters (y)
0	5
1	8
2	11
3	14

ANSWER _____

2 The graph shows a model for points scored, y, after x hours of practice. How many points does the line predict after 7 hours?



ANSWER _____

3 A game gives 2 starting credits and 5 credits per completed task. The model is y = 5x + 2, where x is tasks and y is credits. How many tasks does the model predict you need to reach 32 credits?

ANSWER _____

4 A phone's battery model is y = 50 - 6x, where x is hours of use and y is the percent of battery left. What percent does the model predict after 5 hours?

ANSWER _____

5 A tutor's earnings model is y = 12x + 9, where x is hours worked and y is dollars earned. How much does the model predict for 2.5 hours?

ANSWER _____

6 The table shows actual minutes left on a video download. A linear model for the time left is y = 30 - 3x, where x is minutes since the download began. At x = 2, what does the model predict? How does that compare with the actual time in the table?

TIME LEFT ON A DOWNLOAD

Minutes since start (x)	Actual minutes left (y)
0	30
1	28
2	25
3	22

ANSWER _____

APPLY IT Show your work

1 You start with $18 in your used-game fund. Based on recent sales, the model y = 6x + 18 predicts the total dollars y after you sell x more games. How many more games must you sell for the model to predict $60?

WORK SPACE

ANSWER _____

2 Your phone has 80 GB of free storage. Your recent video recordings suggest the model y = 80 - 5x, where x is hours of video recorded and y is free storage in GB. How many hours of video does the model predict you can record before free storage reaches 40 GB?

WORK SPACE

ANSWER _____

CHALLENGE One step up

Two school clubs track their followers for x weeks after launching their pages. Club A uses the model y = 8x + 30, and Club B uses y = 12x + 6. After how many weeks do the models predict the same number of followers, and how many followers is that?

WORK SPACE AND ANSWER

ANSWER KEY

Model the Moment

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	The table shows water in a tank as it fills. The linear model is y = 3x + 5, where x is minutes and y is liters. How many liters does the model predict after 6 minutes?	**23 liters**
2	The graph shows a model for points scored, y, after x hours of practice. How many points does the line predict after 7 hours?	**15 points**
3	A game gives 2 starting credits and 5 credits per completed task. The model is y = 5x + 2, where x is tasks and y is credits. How many tasks does the model predict you need to reach 32 credits?	**6 tasks**
4	A phone's battery model is y = 50 - 6x, where x is hours of use and y is the percent of battery left. What percent does the model predict after 5 hours?	**20%**
5	A tutor's earnings model is y = 12x + 9, where x is hours worked and y is dollars earned. How much does the model predict for 2.5 hours?	**$39**
6	The table shows actual minutes left on a video download. A linear model for the time left is y = 30 - 3x, where x is minutes since the download began. At x = 2, what does the model predict? How does that compare with the actual time in the table?	**24 minutes; the model predicts 1 minute less than the actual 25 minutes.**

PART 2 · APPLY IT

1. **7 games** Set 60 = 6x + 18. Subtract 18 and divide by 6 to get x = 7.
2. **8 hours** Set 40 = 80 - 5x. Subtract 80 and divide by -5 to get x = 8.

CHALLENGE

After 6 weeks, both models predict 78 followers.

Accept equivalent equations or substitution steps that lead to the listed values. For the download question, the comparison must refer to the actual value of 25 minutes.