

baseball cards cost \$3 each and the box is \$7. How many cards can you buy for at most
 $3x + 7 = 137$
 $x = 43.3$ **(C) 43**

2. Factor $2x^2 + 10x - 72$
 $2(x^2 + 5x - 36)$
 $2(x + 9)(x - 4)$

d. 44

a. $2x(x - 9)(x - 4)$ b. $2(x - 9)(x + 4)$

(C) $2(x + 9)(x - 4)$

d. $2(x - 9)(x - 4)$

3. Factor $4x^2 - 4x - 48$
 $4(x^2 - x - 12)$
 $4(x - 4)(x + 3)$

a. $4(x^2 - x - 12)$ **(b) $4(x - 4)(x + 3)$**

c. $4x(x - 4)(x + 4)$

d. $4(x - 3)(x + 4)$

4. The amount that a plumber charges for his services is based on the number of hours that he works. The charge in dollars, c , is given as a function of the number of hours, h , by the equation $c = 75 + 25h$. Which sentence best describes his charges?

- a. He charges \$75 for the first hour and then \$25 for each remaining hour.
- b. He charges a flat fee of \$25 plus \$75 per hour.
- c. He charges \$100 for each visit.
- (d) He charges a flat fee of \$75 plus \$25 per hour.**

5. Grant has \$58 in a savings account. He plans on depositing \$30 into the account each month and not taking any money out of the account. Which function rule will give the total amount he has in the account T after any number of months, n ?

- a. $T = 58n + 30$
- b. $T = 30 + n + 58$
- (C) $T = 30n + 58$**
- d. $T = 30(58 + n)$

6. In Chapel Hill there are two tutoring companies, Smarty-Pants and Nerds-R-Us. Smarty-Pants charges \$50 up front and \$10 per hour. Nerds-R-Us charges \$40 up front and \$20 per hour. If x represents the number of hours they tutor, write a function that represents the total cost of both tutoring companies tutoring.

- a. $10 - 10x$
- b. $90x + 30$
- c. $90 + 30x^2$
- (d) $90 + 30x$**

7. Note the following regarding a vacation and a car rental company:

- A car rental costs \$30 dollars per day
- A car cost \$0.20 per mile
- You drive 175 miles on the vacation

- Which function rule represents the cost of the car rental for x number of days?
- a. $C(x) = 30x + 0.20$
 - ~~b. $C(x) = 30 + 0.20x$~~
 - (c) $C(x) = 30x + 35$**
 - d. $C(x) = 30x + 3500$
- ~~$30 + 20x$~~
 $30x + .20(175)$

The sequence below shows the total number of days Katrina went swimming by the end of weeks 1, 2, 3, and 4 of her new workout routine. 3, 5, 7, 9, ...
 Which function could be used to find the total number of days Katrina swims at the end of week, w , if her pattern continues?

~~a. $S(w) = 5w - 2$~~

(b. $S(w) = 2w + 1$)
 $2(1) + 1 = 3$
 $2(2) + 1 = 5$

~~c. $S(w) = w + 2$~~
 $2(3) + 1 = 7$
 $2(4) + 1 = 9$

~~d. $S(w) = 5w + 2$~~

9. What is the slope-intercept form of the linear equation with a graph that passes through (3, -5) and is perpendicular to the graph of the following equation $-2x + 3y = 6$?

$3y = 2x + 6$
 $y = \frac{2}{3}x + 2$
 $m = -\frac{3}{2}$

(a. $y = -3/2x - 1/2$)

b. $y = -2/3x - 3$

c. $y = 3/2x - 19/2$

d. $y = 2/3x - 7$

10. A ball is thrown straight up into the air from the top of a building standing at 50 feet with an initial velocity of 65 feet per second. The height of the ball can be modeled by the function $h(t) = -16t^2 + 65t + 50$. When does the ball reach its maximum height?

a. 1.5 sec

(b. 2.03 sec)

c. 3.5 sec

d. 4.7 sec

11. NC: The function $h(x) = -13x^3 + 52x$ represents the approximate height of a rock x seconds after it is thrown. How many seconds does it take for the rock to hit the ground?

$-13x(x^2 - 4)$

$-13x(x+2)(x-2)$
 $x=0$ $x=2$ $x=-2$

2 seconds

12. Find the midpoint of the longest side of a triangle with vertices (-4, 5), (-6, 3) and (0, 1).

$\sqrt{(-6-4)^2 + (3-5)^2}$
 10.2

$\sqrt{(0-6)^2 + (1-3)^2}$
 6.3

$\sqrt{(-4-0)^2 + (5-1)^2}$
 5.6

$(\frac{-4+0}{2}, \frac{5+1}{2})$
 $(-\frac{10}{2}, \frac{8}{2})$
 $(-5, 4)$

13. Solve: $y = 6x - 11$
 $-2x - 3y = -7$

$-2x - 3(6x - 11) = -7$
 $-2x - 18x + 33 = -7$
 $-20x = -40$

$x = 2$
 $y = 6(2) - 11$
 $y = 1$

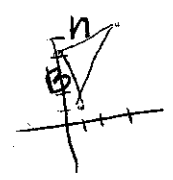
$(2, 1)$

14. Find the area of a right triangle with vertices (0, 4), (3, 5) and (1, 1).

$b = \sqrt{(0-3)^2 + (4-5)^2}$
 $b = 3.16$

$B = \sqrt{(0-1)^2 + (4-1)^2}$
 $B = 3.16$

$A = \frac{1}{2}bh = \frac{1}{2}(3.16)(3.16) = 5$



15. The table contains data about the cost of telephone calls to Sydney, Australia. The long distance service charges a connection fee plus a certain amount per minute. What is the connection fee charged for each call? *linear regression in calc*

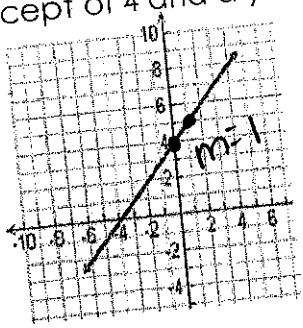
Time (min)	1	5	8	11	20
Cost (cents)	17.9	49.5	73.2	96.9	168

(b. 10)

c. 1

d. 17.9

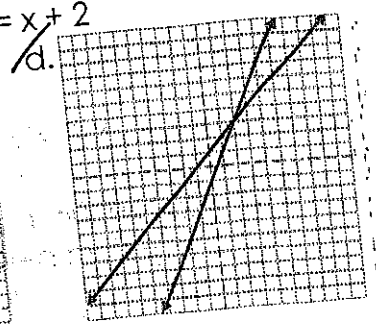
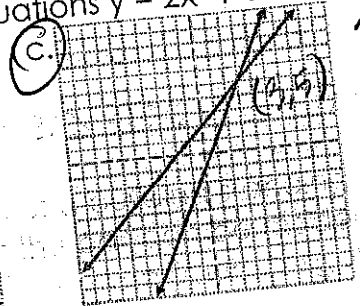
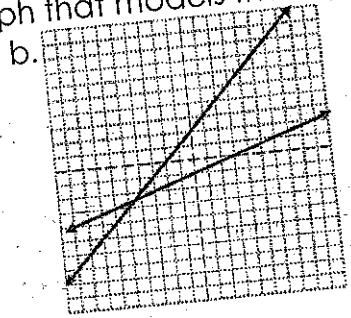
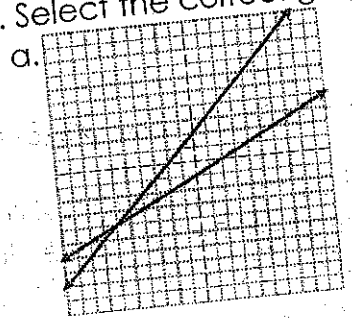
16. Sarah compared the slope of the function shown below to that of a linear function with an x-intercept of 4 and a y-intercept of -2. What is the slope of the function with the smaller slope?



$(4, 0) \quad (0, -2)$
 $m = \frac{-2 - 0}{0 - 4} = \frac{-2}{-4} = \frac{1}{2}$
 a. 1
 c. $\frac{1}{2}$

- b. -1
- d. -1/2

17. Select the correct graph that models the equations $y = 2x - 1$ and $y = x + 2$.



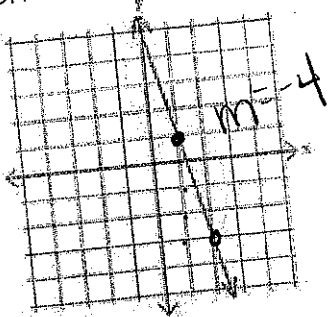
18. A company charges an amount per box, and a shipping fee to ship items to a customer. Below is a table for showing the number of boxes and the total cost of the shipment. What is the shipping fee? *linear regression in calc*

Boxes	Total Cost
5	11.99
13	18.99
2	5.09
7	15.07

$y = 1.19x + 4.73$

- a. \$4.97
- b. \$4.73
- c. \$1.19
- d. \$5.09

19. Compare the slope of the graph to a line with a y-intercept of -3 and an x-intercept of 1. Which one has the smaller slope?



$(0, -3) \quad (1, 0)$
 $m = \frac{0 - (-3)}{1 - 0} = \frac{3}{1} = 3$ ← smaller slope

20. Which of the following situations would represent exponential growth or decay?
- a. John has \$100 in his piggy bank and he puts \$10 in it each week.
 - b. May is trying to gain weight so she can join the wrestling team. She is currently gaining 3 pounds each week.
 - c. Sue is going shopping this weekend and she has a coupon for 10% off her entire purchase at Kohl's.
 - (d) Jack is on the wrestling team and is trying to get into a smaller weight class. He is losing 5% of his weight each week.

21. A company surveyed 3000 customers of 3 bus companies. A study compared the on-time performance for the 3 bus companies. A frequency table is shown below. How many more Cross-Country Bus customers were on time than the Express Way Lines customers?

	On-Time	Late	Total
Cross-Country	1140	150	1290
Express Way	960	90	1050
Red Dog Transit	540	120	660
Total	2640	360	3000

a. 960

b. 1140

(c) 180

d. 420

$$1140 - 960 = 180$$

22. The table below shows the charge for different numbers of shirts from an online website. The company charges a cost per shirt and a setup fee per order. What is the difference between the observed and predicted total cost of ordering 150 shirts?

Shirts Ordered (x)	Total Cost (y)
100	345
125	363
150	354
175	339

$$y = -.108x + 365$$

$$y = -.108(150) + 365$$

$$y = 348.8$$

$$354 - 348.8 = 5.2$$

23. The distribution of 1,000 students at a high school is shown in the frequency table below. Approximately what percent of freshman are male?

Class	Male	Female
Freshmen	130	80
Sophomores	110	150
Juniors	160	120
Seniors	120	130

$$\frac{80}{210} = .38 \approx 38\%$$

24. Simplify $(x - 4)^2$

	x	-4
x	x^2	$-4x$
-4	$-4x$	$+16$

$$x^2 - 8x + 16$$