

Answer all 24 questions in this part. Each correct answer will receive 2 credits. No partial credit will be allowed. Utilize the information provided for each question to determine your answer. Note that diagrams are not necessarily drawn to scale. For each statement or question, choose the word or expression that, of those given, best completes the statement or answers the question. Record your answers on your separate answer sheet. [48]

- 1 Which expression is equivalent to $16x^2 - 36$?
- (1) $4(2x - 3)(2x - 3)$ (3) $(4x - 6)(4x - 6)$
 (2) $4(2x + 3)(2x - 3)$ (4) $(4x + 6)(4x + 6)$

plug your answers into y_2

plug into y_1

Use this space for computations.

use calc trick!

x	y_1	y_2
0	-36	
1	-20	

- 2 What is the solution set of the equation $(x - 2)(x - a) = 0$?
- (1) -2 and a (3) 2 and a
 (2) -2 and -a (4) 2 and -a

If these match then it is equivalent.

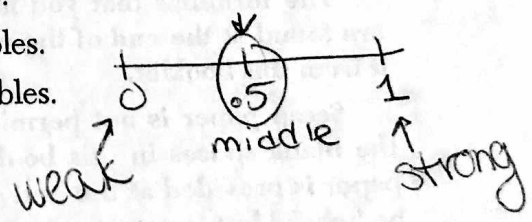
$$(x-2)(x-a) = 0$$

$$\begin{array}{l|l} x-2=0 & x-a=0 \\ +2 & +a \\ \hline x=2 & x=a \end{array}$$

- 3 Analysis of data from a statistical study shows a linear relationship in the data with a correlation coefficient of -0.524. Which statement best summarizes this result?

- (1) There is a strong positive correlation between the variables.
 (2) There is a strong negative correlation between the variables.
 (3) There is a moderate positive correlation between the variables.
 (4) There is a moderate negative correlation between the variables.

negative correlation



- 4 Boyle's Law involves the pressure and volume of gas in a container. It can be represented by the formula $P_1V_1 = P_2V_2$. When the formula is solved for P_2 , the result is

- (1) $P_1V_1V_2$ (3) $\frac{P_1V_1}{V_2}$
 (2) $\frac{V_2}{P_1V_1}$ (4) $\frac{P_1V_2}{V_1}$

$$\frac{P_1V_1}{V_2} = \frac{P_2V_2}{V_2}$$

$$\frac{P_1V_1}{V_2} = P_2$$

Use this space for computations.

5 A radio station did a survey to determine what kind of music to play by taking a sample of middle school, high school, and college students. They were asked which of three different types of music they prefer on the radio: hip-hop, alternative, or classic rock. The results are summarized in the table below.

	Hip-Hop	Alternative	Classic Rock
Middle School	28	18	4
High School	22	22	6
College	16	20	14

part = classic
whole = college

What percentage of college students prefer classic rock?

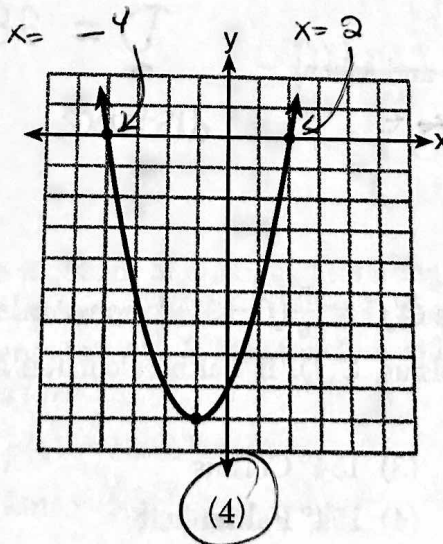
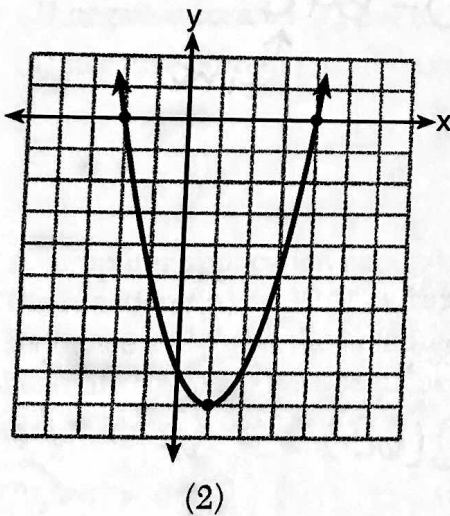
- (1) 14% (3) 33%
 (2) 28% (4) 58%

$$= \frac{14}{50} = .28 \quad 28\%$$

6 Which function has zeros of -4 and 2? *where it hits the x axis*

$f(x) = x^2 + 7x - 8$
 (1)

$g(x) = x^2 - 7x - 8$
 (3)



Note that diagrams are not necessary. Numerical answer with no work shown will receive only 1 credit. All answers should be written in pen, except for graphs and drawings, which should be done in pencil. [16]

25 In attempting to solve the system of equations $y = 3x - 2$ and $6x - 2y = 4$, John graphed the two equations on his graphing calculator. Because he saw only one line, John wrote that the answer to the system is the empty set. Is he correct? Explain your answer.

$$y = 3x - 2$$

$$\begin{array}{r} 6x - 2y = 4 \\ -6x = -6x \end{array}$$

$$\begin{array}{r} -2y = 4 - 6x \\ -2 = -2 \end{array}$$

$$y = -2 + 3x$$

OR

$$y = 3x - 2$$

John saw 1 line b/c both equations are the same when in $y = mx + b$ form. Since they are the same that means every point on the line intersects so every point is a solution. Therefore, John was incorrect

26 A typical marathon is 26.2 miles. Allan averages 12 kilometers per hour when running in marathons.

Determine how long it would take Allan to complete a marathon, to the nearest tenth of an hour. Justify your answer.

26.2 miles

12 kilometers per hour

↓
want to
make this miles

1 km = .62 miles

12 km = $12(.62) = 7.44$ miles

He goes 7.44 miles
for every hour.

$$\div \frac{26.2 \text{ miles total}}{7.44}$$

$$= 3.521505376$$

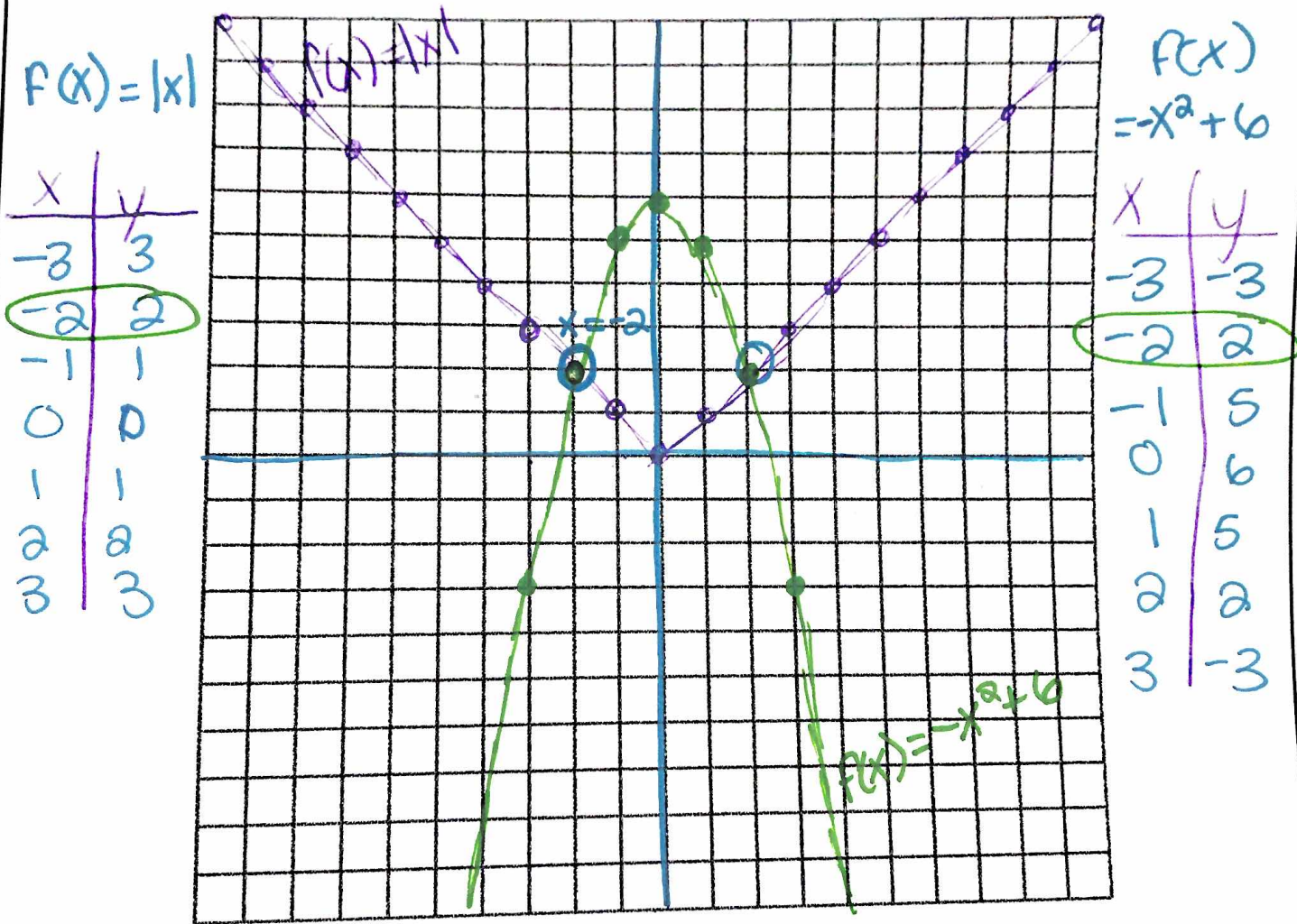
3.5 hours

It will take him 3.5 hours
to run the race.

Utilize the information provided for each question to determine your answer. Answers are not necessarily drawn to scale. For all questions in this part, a correct numerical answer with no work shown will receive only 1 credit. All answers should be written in pen, except for graphs and drawings, which should be done in pencil. [16]

33 Graph $f(x) = |x|$ and $g(x) = -x^2 + 6$ on the grid below. Does $f(-2) = g(-2)$? Use your graph to explain why or why not.

$x = -2$



yes when $x = -2$ both graphs are equal. That is where they intersect on the graph and table

[18]