

Rapid fire

True or false?

$$1) \frac{2-x}{x} = \frac{2x}{x^2} - 1$$

$$2) 1 + \frac{1}{x} = \frac{1+x}{\sqrt{x^2}}$$

$$3) 1 - (-x + 3x^2) = 1 - 3x^2 + 4x - 3x$$

$$4) (x^2)^{-1/2} = \frac{1}{x}$$

$$5) x^2 \cdot x^{-1/2} = \frac{1}{x}$$

$$6) x^2 \cdot x^{-1/2} = x\sqrt{x}$$

$$7) \frac{1}{x^2} - \frac{x}{x^2} = \frac{1-x}{x^2 - x^2}$$

$$8) \frac{1 + \frac{1}{x}}{\frac{1}{x}} = 1 + x$$

$$9) |x^3| \geq x^3 \text{ for all } x$$

$$10) \quad 3x(-1-x) - (x+1) = -1-x-3x-3x^2$$

$$11) \quad 1 - x(1+x) = (1-x)(1+x)$$

$$12) \quad \frac{(x-1)^2}{(x-1)^3} = (-1+x)^{-1}$$

$$13) \quad \frac{(x-1)^3}{x-1} = (x-1)^2$$

$$14) \quad \frac{(x-1)^3}{x-1} = \frac{(1-x)^3}{1-x}$$

$$15) \quad x^2 \leq x^5 \quad \text{for } 0 < x < 1$$

$$16) \quad x^2 \geq x^5 \quad \text{for } -1 < x < 0$$

$$17) \quad x^2 \geq x^5 \quad \text{for } x > 1$$

$$18) \quad x^2 \geq x^5 \quad \text{for } x < -1$$

$$19) \quad 1 + |x|^2 \leq 1 + x \quad \text{for } 0 < x < 1$$

$$20) \quad x+y > 2x \quad \text{if } y = x+1$$

Problems

1) A girl wants to buy a few books at a book sale. Since the book seller wants to ensure all the girls who want to buy a book get a chance to buy one, he charges ^{more} per book if some one buys more than one book.

The seller has the following rule:

Price of a book (each book) is the same as number of books you buy (in dollars).

(a) Write ~~the~~ the formula to calculate the total price.

(b) If Sarah buys 12 books, how much would she pay?

2) Draw a graph showing the number of books and their total price.



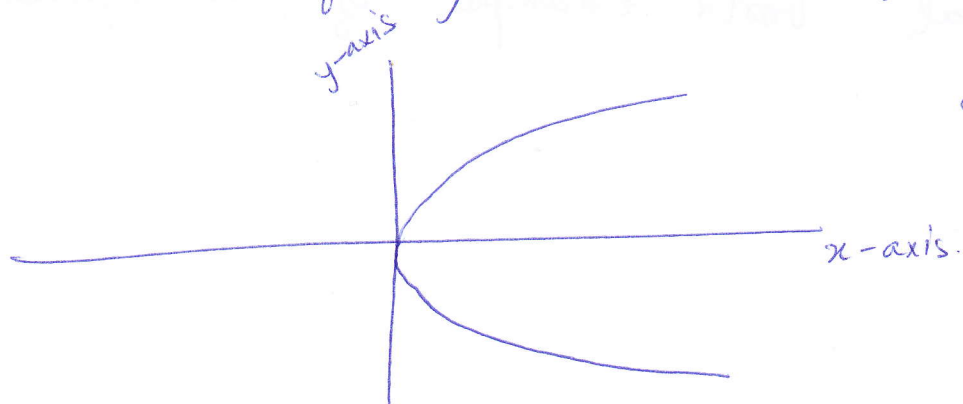
3) If the book seller had charged just \$1.00 for each book, would that have been cheaper or more expensive than his current scheme?

(a) if some one bought 3 books?

(b) if someone bought 1 book?

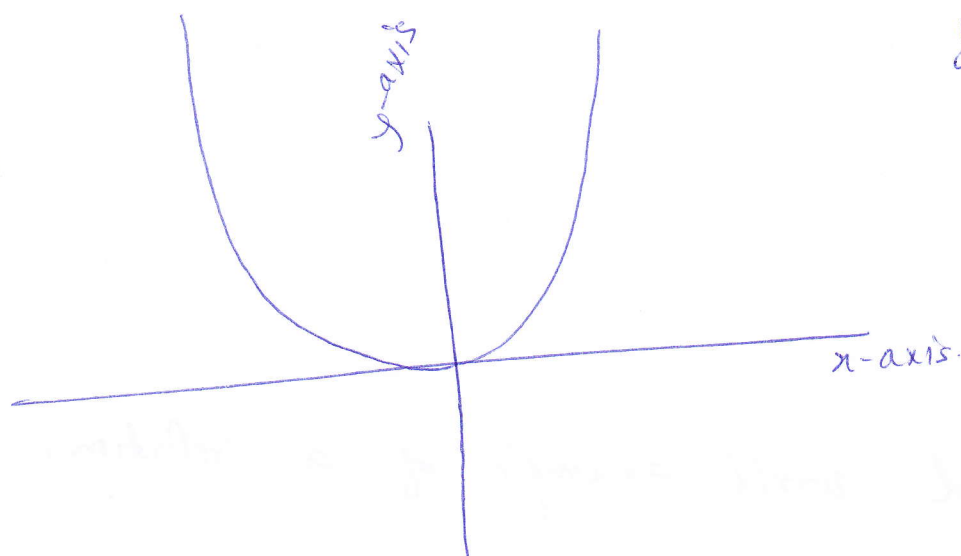
4) ~~Is~~ Is the following the graph of a function $f(x)$?

(a)



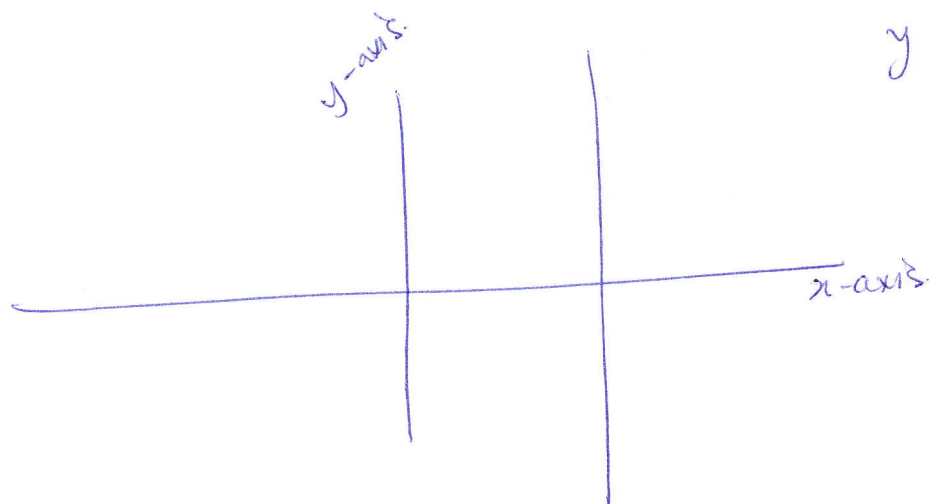
$$y = f(x) = ?$$

(b)



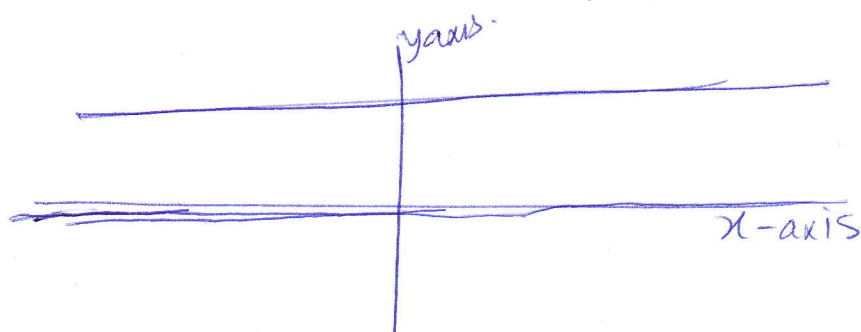
$$y = f(x) = ?$$

(c)



$$y = f(x) = ?$$

d)



$$y = f(x) = ?$$

(5) Give a real world example of a function

6) Give a real world example of a relation.