

1) Given $f(x) = 5x - 7$ and $g(x) = 3x^2 + 2$, find

a) $g(a-3)$ b) $f(g(5))$ c) $f^{-1} g 5$

2) Can a set have exactly 12 subsets? Explain.

3) $\sqrt{y-7} + 5 = x + 2$. Solve for y , in terms of x .

4) Sketch the two graphs $y = 3x - 5$ and $y = -3x + 5$. Label each graph.

5) Sketch the graph of $y = |3x - 5|$.

6) Explain how the graphs in problems 4 and 5 are related.

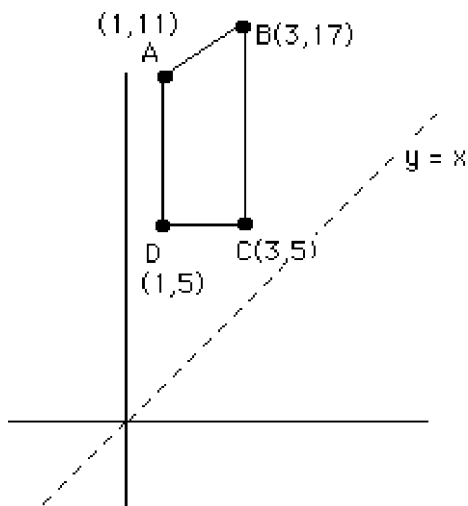
7) NC Solve: (Make sure to state any restrictions on the variable!)

a) $\frac{3}{x+5} - \frac{1}{x-2} = \frac{5}{2x+10}$

b) $\frac{3}{x+6} + \frac{2}{x-3} = \frac{7}{x^2 + 3x - 18}$

c) $\frac{4x-3}{6x+5} = \frac{2x+3}{3x-2}$

8)

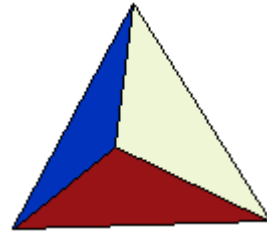


The vertices matrix of quadrilateral ABCD

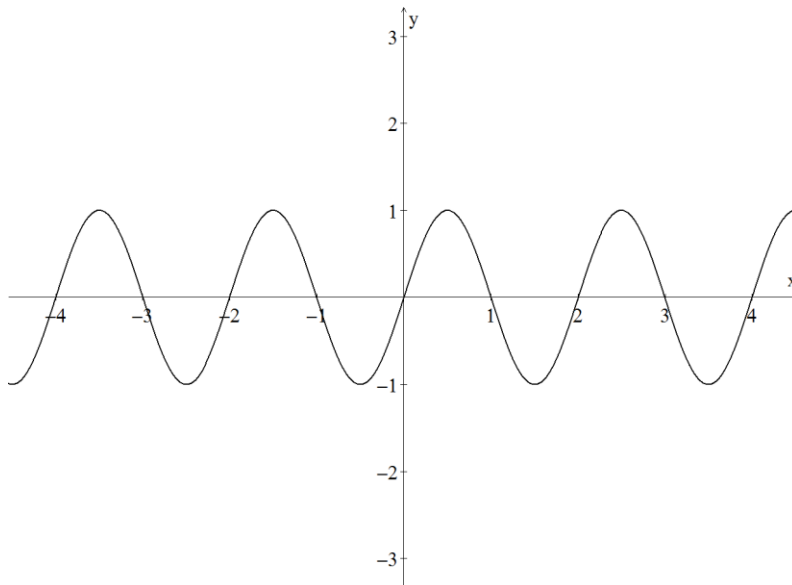
is $\begin{bmatrix} 1 & 1 & 3 & 3 \\ 11 & 5 & 5 & 17 \end{bmatrix}$. The quadrilateral is

first reflected over $y = x$ and then is reflected over the y -axis. Find the new vertex matrix of the resultant quadrilateral. Show the matrix multiplication that leads to your answer.

- 9) How many different tetrahedrons are determined by:
- a) 4 points in space, given no four of them are co-planar?
 - b) 5 points in space, given no four of them are co-planar?
 - c) 15 points in space, given no four of them are co-planar?
 - d) n points in space, given no four of them are co-planar?

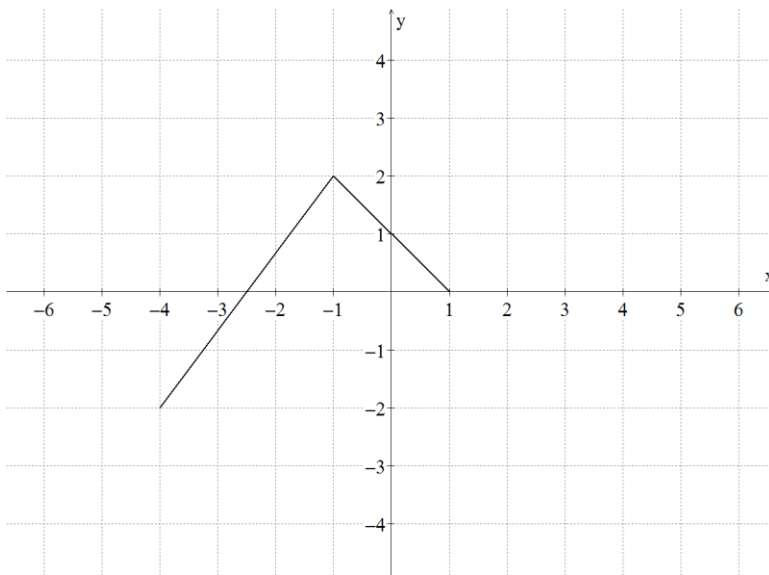


- 10) The graph $y = f(x)$ is given below. Sketch the graph of $y = 3f\left(\frac{1}{2}x\right)$.



- 11) a) Under what conditions will $|a + b| = |a| + |b|$?
- b) Under what conditions will $|x + y| < |x| + |y|$?

12) Given the graph $y = f(x)$, sketch the graphs, labeling key points.



a) $y = f(x) + 2.$

b) $y = f(2x)$

c) $y = 2f(x-4)$

13) Recall that $\lfloor x \rfloor$ means the greatest integer less than or equal to x . Solve the following equations, putting your answers in interval notation.

a. $\lfloor 3x \rfloor - 2 = 5.$

b. $\lfloor x^2 \rfloor = 4.$

Sigma Notation

The symbol \sum means “the SUM of” For example:

$$\sum_{n=1}^5 n^2 = 1^2 + 2^2 + 3^2 + 4^2 + 5^2 \quad \text{(this is expanded form)}$$

$$= 55 \quad \text{(solution)}$$

14) Expand each, and then solve or simplify:

(a) $\sum_{n=0}^7 2^n$

(b) $\sum_{n=0}^3 \frac{27}{3^n}$

(c) $\sum_{k=1}^6 (-1)^k (2k)$

15) Write the sum $6 + 8 + 10 + 12 + \dots + 46$ in \sum notation.