

Name:

Show all work. Calculators are allowed.

Time:

1. Given $f(x) = x^2$, find $f(x + h)$.

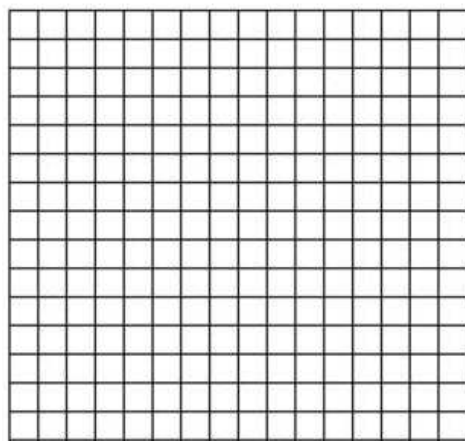
2. What are the exact values of (a) $\sin \frac{\pi}{6}$ and (b) $\cos \frac{\pi}{6}$?

3. Simplify:

$$\frac{\frac{1}{x+h} - \frac{1}{x}}{h}$$

4. Graph the function

$$y = \sin\left(x - \frac{\pi}{4}\right)$$

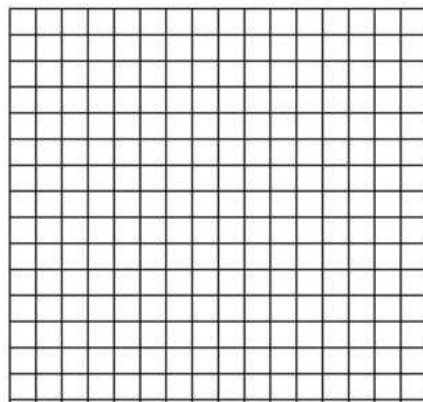


5. Graph the set on a number line:

$$\{x \in \mathbb{R} : |x - 3| < 4\}$$

Note that \mathbb{R} denotes the set of real numbers.

6. Graph the circle whose equation is given by $x^2 + y^2 + 6x - 6y + 2 = 0$. Indicate the coordinates of the center of the circle and the length of the radius of the circle.



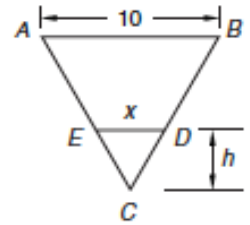
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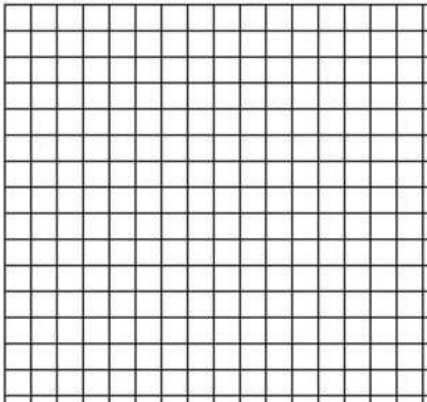
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7. Solve for x : $\log(1 + x) + \log(2 + x) = 2$

8. Triangle ABC is an equilateral triangle and segment ED is parallel to segment AB as shown in the figure below. Express x in terms of h .



9. Find all pairs (x, y) that simultaneously satisfy the following two equations: $x^2 + y^2 = 9$ and $y - x = 1$. Graph the two equations, and show the points of intersection of the graphs.



10. Prove the following trigonometric identity:

$$\frac{\cos^3(x) + \sin^3(x)}{\cos(x) + \sin(x)} = 1 - \sin(x) \cos(x)$$

11. Write an algebraic equation that expresses the following statement: the sum of the distance between point (x, y) and point $(1, 2)$ and the distance between point (x, y) and point $(3, 4)$ is equal to 10.

12. Given:

$$\overline{XZ} \cong \overline{YZ}, \overline{XV} \perp \overline{YZ}, \overline{YU} \perp \overline{XZ}.$$

Write a two-column proof to show that

$$\overline{XV} \cong \overline{YU}.$$

