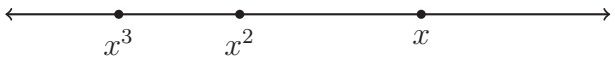
1.

If x, x^2 and x^3 lie on a number line in the order shown below, which of the following could be the value of x?



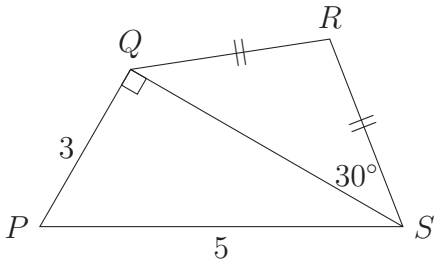
(A) -2 (B) $-\frac{1}{2}$ (C) $\frac{3}{4}$ (D) 1 (E) $\frac{3}{2}$

2.

If $\dfrac{p}{p-2q} = 3$ then $\dfrac{p}{q}$ equals

3.

In the diagram, $PS = 5$, $PQ = 3$, $\triangle PQS$ is right-angled at Q, $\angle QSR = 30^\circ$ and $QR = RS$. The length of RS is



4.

Given that $f_1(x) = \dfrac{x}{x+1}$ and $f_{n+1}(x) = f_1(f_n(x))$, then $f_{2014}(x)$ equals

5.

The sequence

$$2\ ,\ 2^2\ ,\ 2^{2^2}\ ,\ 2^{2^{2^2}}\ ,\ldots$$

is defined by $a_1 = 2$ and $a_{n+1} = 2^{a_n}$ for all $n \geq 1$. What is the first term in the sequence greater than 1000^{1000}?

(A) $a_4 = 2^{2^{2^2}}$ (B) $a_5 = 2^{2^{2^{2^2}}}$ (C) $a_6 = 2^{2^{2^{2^{2^2}}}}$ (D) $a_7 = 2^{2^{2^{2^{2^{2^2}}}}}$ (E) $a_8 = 2^{2^{2^{2^{2^{2^{2^2}}}}}}$

6.

What is the largest three-digit number with the property that the number is equal to the sum of its hundreds digit, the square of its tens digit and the cube of its units digit?