The Factor Theorem

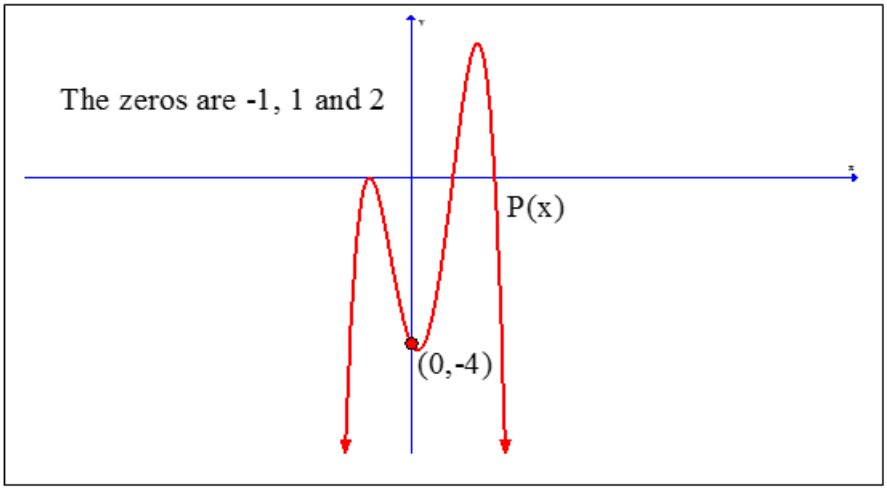
1. The cubic function, y = P(x) has zeros of -2, 1, and 4. If P(0) = 16, what is the value of $P\left(\frac{1}{2}\right)$, accurate to 2 decimals?

2. The polynomial $P(x) = 3x^4 - 11x^3 + 3x^2 + 11x - 6$ has a linear factor of $(x - 3)$. What is the remaining cubic factor?

3. For the polynomial $P(x) = x^3 - 7x^2 - kx + 16$, one zero is -2. What is the largest zero of P(x)?

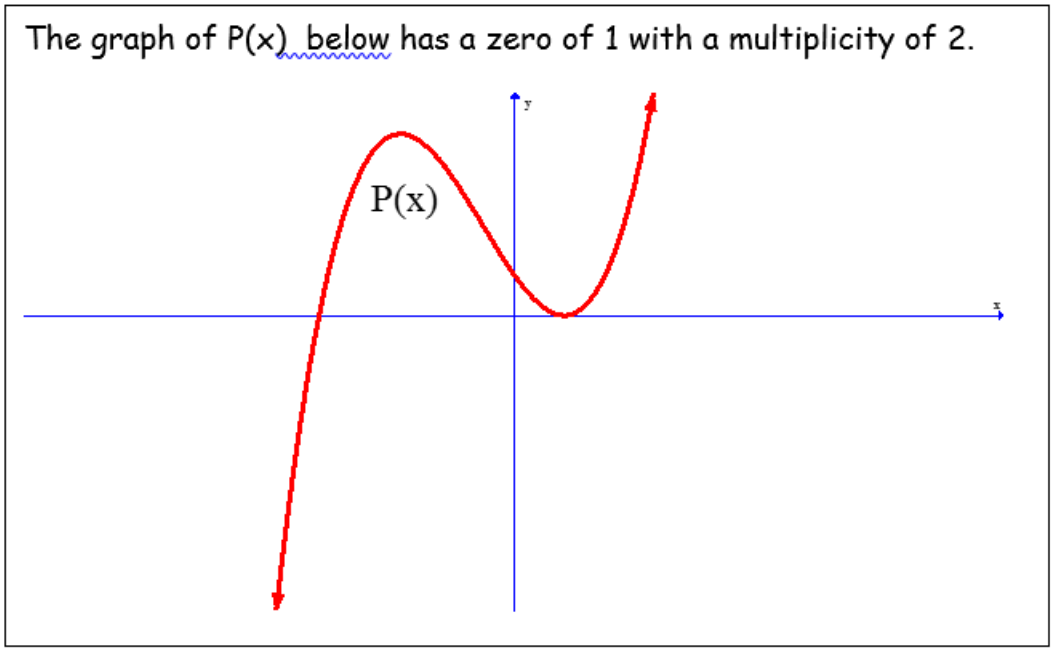
4. For $P(x) = x^3 - 6x^2 - 3x + 40$, the zeros can be written as x = m, and $x = \frac{n \pm \sqrt{p}}{2}$. What is the value of p?

Use the following information to answer the next question.



5. The polynomial P(x) can be written in the form $y = a(x + b)^2 (x - c) (x - d)$. What is the value of a?

Use the following information to answer the next question.



6. When P(x) is written in the form, $y = 0.2(x + b)(x - c)^2$, where $b,c \in N$, if the y-intercept is 0.8, what is the value of the other zero?

7. Given the polynomial function, $P(x) = 3x^4 - 4x^3 - 11x^2 + 16x - 4$, which of the following statements is incorrect?

   a) $P(1) = 0$
   b) The potential zeroes are $\pm 1, \pm 2, \pm 4$.
   c) $P(x) \div (3x^2 + 7x + 2) = (x - 1)(x + 2)$
   d) $(3x - 1)$ is a factor of $P(x)$.

8. If $(x + 4)$ is a factor of $x^3 + 2x^2 - kx + 4$, determine the value of k.

   a) -7 b) 25 c) -25 d) 7

9. The polynomial function $P(x) = x^3 + bx^2 - 7x + 2b$, where $b \in N$, has a factor of $(x - 1)$. When written as $P(x) = (x + k)(x - 1)^2$, find the value of k.

10. When $x^3 - x^2 - 16x - 4m$ is divided by $(x - m)$, the remainder is 0. Find m.