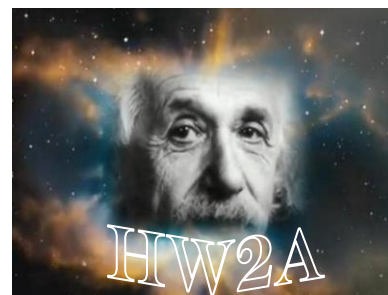


In exercises 1 – 10, state whether the function is a polynomial function (yes or no). Find the zeros for each function, regardless of whether it is a polynomial function or not.



- 1) $f(x) = 17 - 3x$ 2) $g(x) = x^2 - 6x + 8$ 3) $f(x) = 9$
- 4) $h(x) = x - \frac{1}{x}$ 5) $k(x) = \frac{x^2 - 3x - 4}{x^2 + 1}$ 6) $g(x) = \frac{x^2 + 2}{2}$
- 7) $j(x) = 1 - 5x + 6x^2$ 8) $f(x) = (x - 7)^2(x^2 + 7)$ 9) $h(x) = 2x^4 - x^3 - x^2$ 10) $p(x) = x^3 - 9x$

Find the indicated values for each function. (Remember: $i^2 = -1$)

- 11) $h(x) = 2x^2 - 5x + 6$
 a) $h(-1)$ b) $h(2i)$ c) $h(1 + i)$
- 12) $f(x) = 8x - 4x^2$
 a) $f(2\sqrt{3})$ b) $f(1 - \sqrt{2})$ c) $f(x - 3)$

Use synthetic substitution to find the indicated values.

- 13) $g(x) = 4x^3 - 5x^2 + 7x - 9$
 a) $g(2)$ b) $g(3)$ c) $g(-3)$
- 14) $h(x) = x^4 - 3x^2 + 7x + 8$
 a) $h(3)$ b) $h(-3)$ c) $h(-2)$
- 15) $j(x) = 3x^3 - 7x^2 + 2x + 3$
 a) $j\left(\frac{1}{3}\right)$ b) $j\left(-\frac{2}{3}\right)$ c) $j(5)$

16) What value of $f(x) = \frac{2x^3 - 3x^2 - 8x + 12}{x - 2}$ is undefined? Attempt to find the zeros of f . (**hint:** it might take a *group* effort)



17) If 4 is a zero of $f(x) = 3x^2 + kx - 2$, find the value of k .

- | | | | |
|-------------------------|----------------------------|-------------------------|-----------------|
| 1) yes; $17/3$ | 8) yes; $7, \pm i\sqrt{7}$ | 12b) -4 | 14c) -2 |
| 2) yes; $2, 4$ | 9) yes; $-1/2, 0, 1$ | 12c) $-4x^2 + 32x + 12$ | 15a) 3 |
| 3) yes; none | 10) yes; $-3, 0, 3$ | 13a) 17 | 15b) $-7/3$ |
| 4) no; $-1, 1$ | 11a) 13 | 13b) 75 | 15c) 213 |
| 5) no; $-1, 4$ | 11b) $-2 - 10i$ | 13c) -183 | 16a) $x \neq 2$ |
| 6) yes; $\pm i\sqrt{2}$ | 11c) $1 - i$ | 14a) 83 | 16b) $-2, 3/2$ |
| 7) yes; $1/3, 1/2$ | 12a) $16\sqrt{3} - 48$ | 14b) 41 | 17) -11.5 |