

Calculus Newton's Method for Finding Zeros, X-intercept or Roots of a Polynomial

Lesson 294 | Calculus AB | Newton's method

<https://www.youtube.com/watch?v=4uGgZmfgxzc>

Original practice aligned to the saved video title.

Name: _____ Date: _____ Show your reasoning.

01

Use two Newton iterations for $f(x)=x^2-11$ from $x_0=4$. Give exact iterates or round only at the end.

02

Use two Newton iterations for $f(x)=x^2-7$ from $x_0=9$. Give exact iterates or round only at the end.

03

Use two Newton iterations for $f(x)=x^2-8$ from $x_0=2$. Give exact iterates or round only at the end.

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04

Use two Newton iterations for $f(x)=x^2-2$ from $x_0=13$. Give exact iterates or round only at the end.

05

Use two Newton iterations for $f(x)=x^2-6$ from $x_0=12$. Give exact iterates or round only at the end.

06

Use two Newton iterations for $f(x)=x^2-5$ from $x_0=7$. Give exact iterates or round only at the end.

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- 01** Use two Newton iterations for $f(x)=x^2-11$ from $x_0=4$. Give exact iterates or round only at the end.

Iteration $x_{\text{next}}=(x+11/x)/2$. $x_1=27/8$; $x_2=1433/432$. These are approximations to $\sqrt{11}$, not exact roots.

- 02** Use two Newton iterations for $f(x)=x^2-7$ from $x_0=9$. Give exact iterates or round only at the end.

Iteration $x_{\text{next}}=(x+7/x)/2$. $x_1=44/9$; $x_2=2503/792$. These are approximations to $\sqrt{7}$, not exact roots.

- 03** Use two Newton iterations for $f(x)=x^2-8$ from $x_0=2$. Give exact iterates or round only at the end.

Iteration $x_{\text{next}}=(x+8/x)/2$. $x_1=3$; $x_2=17/6$. These are approximations to $\sqrt{8}$, not exact roots.

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04

Use two Newton iterations for $f(x)=x^2-2$ from $x_0=13$. Give exact iterates or round only at the end.

Iteration $x_{\text{next}}=(x+2/x)/2$. $x_1=171/26$; $x_2=30593/8892$. These are approximations to $\sqrt{2}$, not exact roots.

05

Use two Newton iterations for $f(x)=x^2-6$ from $x_0=12$. Give exact iterates or round only at the end.

Iteration $x_{\text{next}}=(x+6/x)/2$. $x_1=25/4$; $x_2=721/200$. These are approximations to $\sqrt{6}$, not exact roots.

06

Use two Newton iterations for $f(x)=x^2-5$ from $x_0=7$. Give exact iterates or round only at the end.

Iteration $x_{\text{next}}=(x+5/x)/2$. $x_1=27/7$; $x_2=487/189$. These are approximations to $\sqrt{5}$, not exact roots.