

Calculus Practice: Linear Approximations 1a

For each problem, find a linear approximation of the given quantity.

1) $\sin 911^\circ$

A) $\frac{10}{9} \approx 1.1111$

B) $\frac{9}{7} \approx 1.2857$

C) 1

D) $\frac{10}{7} \approx 1.4286$

2) $\cos 431^\circ$

A) $\frac{\sqrt{2}(90 + \pi)}{180} \approx 0.7318$

B) $\frac{2\sqrt{2}(90 + \pi)}{495} \approx 0.5322$

C) $\frac{\sqrt{2}(90 + \pi)}{210} \approx 0.6272$

D) $\frac{\sqrt{2}(90 + \pi)}{135} \approx 0.9757$

3) 3.03^3

A) $\frac{618}{25} = 24.72$

B) $\frac{2781}{80} = 34.7625$

C) $\frac{19467}{1000} = 19.467$

D) $\frac{2781}{100} = 27.81$

4) 9.02^3

A) $\frac{36693}{25} = 1467.72$

B) $\frac{4077}{5} = 815.4$

C) $\frac{36693}{50} = 733.86$

D) $\frac{146772}{275} \approx 533.7164$

5) 6.01^4

A) $\frac{24462}{25} = 978.48$

B) $\frac{5436}{5} = 1087.2$

C) $\frac{32616}{25} = 1304.64$

D) $\frac{195696}{125} = 1565.568$

6) 1.02^4

A) $\frac{108}{125} = 0.864$

B) $\frac{243}{250} = 0.972$

C) $\frac{81}{100} = 0.81$

D) $\frac{27}{25} = 1.08$

7) $\sqrt{3.7}$

A) $\frac{77}{60} \approx 1.2833$

B) $\frac{63}{40} = 1.575$

C) $\frac{77}{40} = 1.925$

D) $\frac{11}{5} = 2.2$

8) 5.04^4

A) 903

B) 645

C) 774

D) $\frac{1935}{2} = 967.5$

9) 1.03^4

A) $\frac{28}{25} = 1.12$

B) $\frac{56}{55} \approx 1.0182$

C) $\frac{42}{25} = 1.68$

D) $\frac{98}{125} = 0.784$

10) $\sin 891^\circ$

A) $\frac{5}{2} = 2.5$

B) $\frac{9}{7} \approx 1.2857$

C) 1

D) $\frac{8}{11} \approx 0.7273$

11) 0.99^3

A) $\frac{873}{1000} = 0.873$

B) $\frac{97}{100} = 0.97$

C) $\frac{97}{160} \approx 0.6063$

D) $\frac{97}{120} \approx 0.8083$

12) $\cos 1511^\circ$

A) $\frac{-180\sqrt{3} - \pi}{360} \approx -0.8748$

B) $\frac{-180\sqrt{3} - \pi}{324} \approx -0.9719$

C) $\frac{-180\sqrt{3} - \pi}{240} \approx -1.3121$

D) $\frac{-180\sqrt{3} - \pi}{432} \approx -0.729$

13) $\sqrt[3]{26.7}$

A) $\frac{538}{225} \approx 2.3911$

B) $\frac{1883}{450} \approx 4.1844$

C) $\frac{269}{110} \approx 2.4455$

D) $\frac{269}{90} \approx 2.9889$

14) $\sqrt[3]{26.8}$

A) $\frac{404}{135} \approx 2.9926$

B) $\frac{1616}{405} \approx 3.9901$

C) $\frac{404}{81} \approx 4.9877$

D) $\frac{808}{405} \approx 1.9951$

15) $\cos 1481^\circ$

A) $\frac{2(-90\sqrt{3} + \pi)}{315} \approx -0.9698$

B) $\frac{7(-90\sqrt{3} + \pi)}{1080} \approx -0.99$

C) $\frac{-90\sqrt{3} + \pi}{72} \approx -2.1214$

D) $\frac{-90\sqrt{3} + \pi}{180} \approx -0.8486$

16) 7.01^4

A) $\frac{60368}{25} = 2414.72$

B) $\frac{15092}{5} = 3018.4$

C) $\frac{45276}{25} = 1811.04$

D) $\frac{241472}{125} = 1931.776$

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