



LESSON 27

MA 16100 · FALL 2022

DR. HOOD



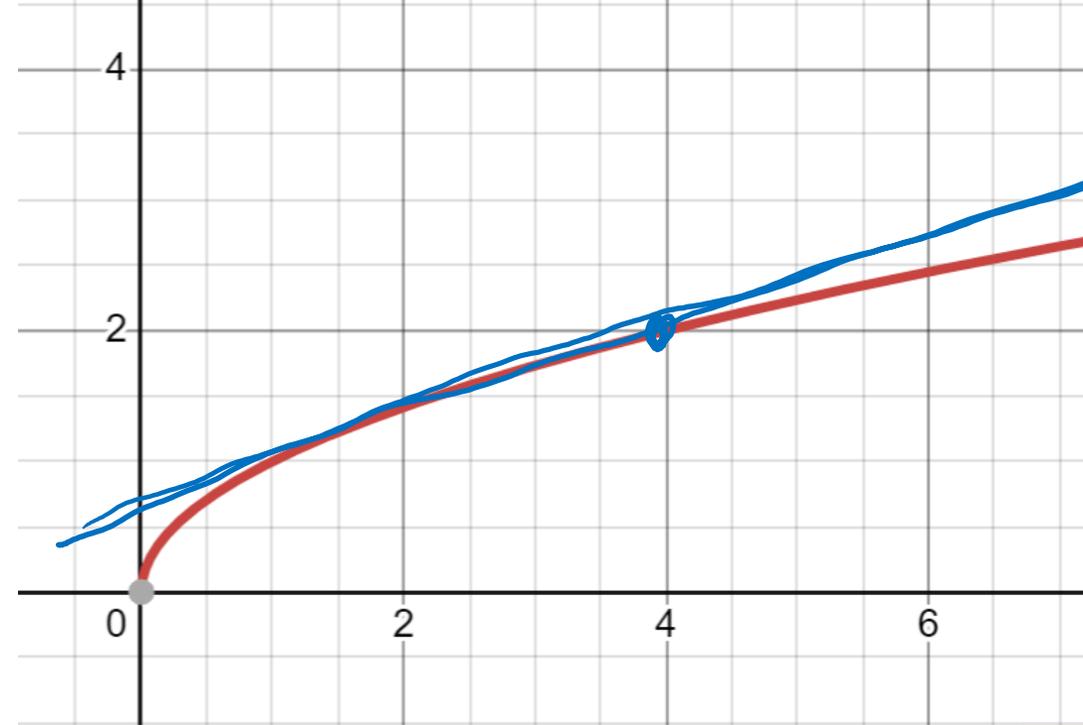
WARM UP

What is the equation of the line tangent to $f(x) = \sqrt{x}$ at the point $(4, 2)$?

a) $y = \frac{1}{2}x$

b) $y = \frac{1}{4}x + 1$

c) $y = x - 2$



slope $f'(4)$
 $= \frac{1}{2}x^{-1/2} \Big|_{x=4} = \frac{1}{2}(4)^{-1/2}$
 $= \frac{1}{4}$

ANNOUNCEMENTS

- Dr. Hood's Office Hours in Math 844
 - Mon and Wed at 3:30-4:30pm
 - Friday at 2:30-3:30pm
- TA's Office Hours in the [Math Resource Room](#)
 - WTHR 313
 - Mon – Thu from 9:30am – 8:30pm
 - Fri from 9:30am – 3:30pm

ANNOUNCEMENTS

- Thanksgiving Break
 - University Holiday is Wed Nov 23 – Fri Nov 25
 - MA 161 additional breaks:
 - No class on Mon Nov 21
 - No recitation on Tue Nov 22
 - No HW or Quizzes that week
 - Math Resource Room closed Mon Nov 21 – Fri Nov 25
 - *No Office Hours*

POLL 1

What is the percent error of $\sin(0.1)$ using the small angle approximation $\sin(x) \approx x$?

a) 0.167%

b) 0.002%

c) 0.017%

$$\sin(0.1) = 0.09983\dots$$

$$\left| \frac{\text{approx} - \text{exact}}{\text{exact}} \right| \times 100$$

$$= \left| \frac{0.1 - \sin(0.1)}{\sin(0.1)} \right| \times 100$$

$$= 0.167\%$$

POLL 2

Use differentials to estimate ΔA when $r = 4$, $\Delta r = 0.1$, and $A(r) = \pi r^2$.

a) 0.8π

b) 8π

c) 1.6π

$$\begin{aligned}\Delta A &\approx A'(4) \Delta r \\ &= (2\pi r)|_{r=4} (0.1) \\ &= 8\pi (0.1) \\ &= 0.8\pi\end{aligned}$$