

skated lesson of
 15 min
 (skated early)

Name KEY

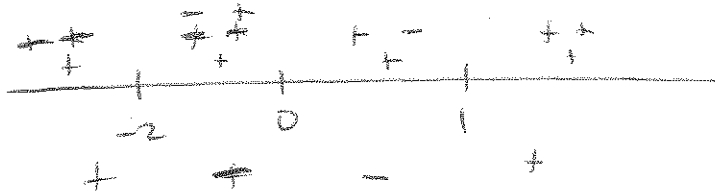
X 156/20

1. Solve for x :

S

$$\frac{x^2(x+2)}{x-1} \geq 0 \quad x=0, x=-2, x=1$$

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$$\begin{aligned} & \text{---} \cup \text{---} \\ & (-\infty, 0] \cup (1, \infty) \\ & (-\infty, -2] \cup \{0\} \\ & \cup (1, \infty) \end{aligned}$$

1/2

2. Between what two integers do we know that $\sqrt{234}$ falls? Show reasons.

25

$$\begin{aligned} x^2 - 234 &= 0 && \text{some were trying to do fact} \\ x=15 \quad x^2 &= 225 && \text{---} \\ x=16 \quad x^2 &= 256 && \text{+} \end{aligned}$$

3. Find the equation of the straight line tangent to the curve $y = x^2$ at the point $(2, 8)$. [You may use formulas in this problem.]

S

$$\begin{aligned} \frac{dy}{dx} &= 3x^2 && y-8 = 12(x-2) \\ m &= 3(2)^2 = 12 && y = 12x - 24 + 8 \\ & \text{must get} && \boxed{y = 12x - 16} \end{aligned}$$

4. Using only the definition, find:

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- a. $f'(2)$, when $f(x) = 3x^2 - 2$. [You may find $f'(a)$ or $f'(x)$ first if you wish.]
 - b. $f'(a)$, when $f(x) = \sqrt{x}$. [Or find $f'(x)$ if you want.]
- [If you can't do this, find $f'(4)$ for partial credit.]

a. $f'(2) = \lim_{x \rightarrow 2} \frac{(3x^2 - 2) - (3(2)^2 - 2)}{x - 2} = \lim_{x \rightarrow 2} \frac{3x^2 - 2 - 12 + 2}{x - 2}$

most get
 1/2 find f'(x)

$$= \lim_{x \rightarrow 2} \frac{3(x^2 - 4)}{x - 2} = \lim_{x \rightarrow 2} \frac{3(x-2)(x+2)}{x-2} = 3(2+2) = 12$$

b. $f'(a) = \lim_{x \rightarrow a} \frac{\sqrt{x} - \sqrt{a}}{x - a} = \frac{\sqrt{x} + \sqrt{a}}{\sqrt{x} + \sqrt{a}} = \lim_{x \rightarrow a} \frac{x - a}{(x - a)(\sqrt{x} + \sqrt{a})}$

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$$= \lim_{x \rightarrow a} \frac{1}{\sqrt{x} + \sqrt{a}} = \frac{1}{\sqrt{a} + \sqrt{a}} = \frac{1}{2\sqrt{a}}$$