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MAC 1105.1A26
Cyr

Quiz 10
You must show all work to receive full credit!!

Problem 1. (2 pts) The number of minutes you waste due to various distractions while studying college algebra is given by the function $W(t) = \frac{1}{4}t^2 - 3t + 24$, where t is the number of hours you study. What is the minimum amount of time you could waste? Minimum occurs at the vertex.

$t_v = \frac{-b}{2a} = \frac{-(-3)}{2(\frac{1}{4})} = \frac{3}{1/2} = 3 \cdot \frac{2}{1} = 6$ hours

Want minimum time wasted, which is dependent variable

$W_v = W(t_v) = W(6) = \frac{1}{4}(6)^2 - 3(6) + 24 = \frac{1}{4}(36) - 18 + 24 = 9 - 18 + 24$

$= \boxed{15 \text{ minutes}}$

Problem 2. (3 pts) Sketch the graph of $f(x) = x^2(x-1)(x+2)$ by making a table describing the function's behavior at each zero and applying the leading coefficient test.

Factor	Zero	Multiplicity	Behavior
x^2	0	2	bounce
$x-1$	1	1	cross
$x+2$	-2	1	cross

Leading term: $x^2 \cdot x \cdot x = x^4$
Degree = 4 is even, so point in same direction
Coefficient = $1 > 0$ so ↑↑