

Precalculus - Introduction to Limits - Test Answer Key

Common Core F-IF.B.6, F-IF.C.7d · maths-pdf.fr/en/

Worked solutions and scoring notes for the 9-question limits test. Use the scoring line under each solution to award partial credit.

Precalculus · Common Core State Standards: **F-IF.B.6, F-IF.C.7d**

Question 1 - Average rate of change [2 pts]

$$f(4) = 4 \text{ and } f(1) = -2. \frac{4 - (-2)}{3} = 2.$$

2

Scoring: 1 point for the two values, 1 point for the quotient.

Question 2 - Limit from a table [2 pts]

The values approach 2 from both sides. At $x = 1$ the denominator is zero.

The limit is 2

Scoring: 1 point for the limit, 1 point for the explanation.

Question 3 - Factor and cancel [2 pts]

$$\frac{(x-5)(x+5)}{x-5} = x+5.$$

10

Scoring: 1 point for factoring, 1 point for the limit.

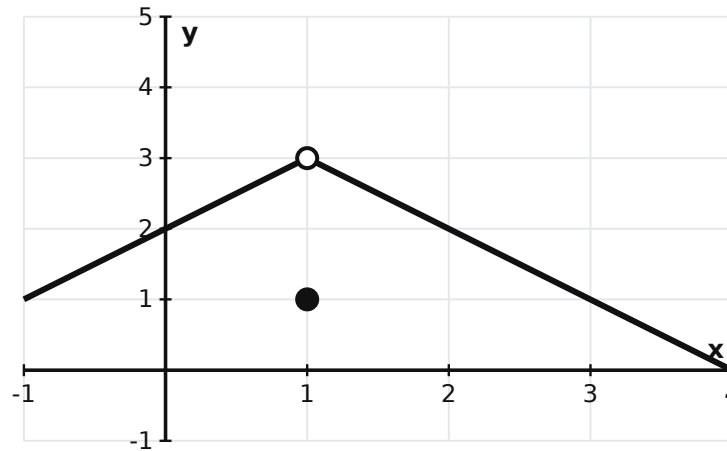
Question 4 - Rationalize [2 pts]

$$\frac{(\sqrt{x}-3)(\sqrt{x}+3)}{(x-9)(\sqrt{x}+3)} = \frac{1}{\sqrt{x}+3} \rightarrow \frac{1}{6}.$$

$\frac{1}{6}$

Scoring: 1 point for rationalizing, 1 point for the limit.

Question 5 - Read a graph [3 pts]



Both pieces approach height 3.

(a) Both are 3. (b) The limit is 3, and $f(1)=1$. (c) No, since $f(1) \neq \lim_{x \rightarrow 1} f(x)$; it is a removable discontinuity.

3 and 3; limit 3, $f(1)=1$; not continuous

Scoring: 1 point for each part.

Question 6 - Limits at infinity [2 pts]

(a) Equal degrees: $\frac{6}{2}=3$. (b) The denominator has the higher degree: 0.

(a) 3; (b) 0

Scoring: 1 point each.

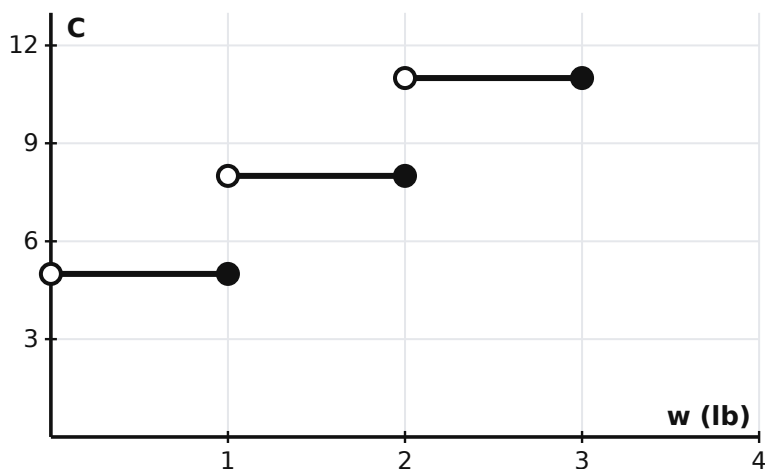
Question 7 - Infinite limits [2 pts]

Slightly above 3, $x-3$ is a small positive number. Slightly below, it is a small negative number.

∞ and $-\infty$

Scoring: 1 point each.

Question 8 - Step function [3 pts]



(a) \$8. (b) \$11. (c) No, because the one-sided limits are different.

\$8; \$11; no

Scoring: 1 point for each part.

Question 9 - Continuity [2 pts]

Left limit 3. Right value $2k-3$. Set $2k-3=3$.

$$k=3$$

Scoring: 1 point for the equation, 1 point for k .

Total

20 points