

1. Polynomial and Rational Functions

Starter Quiz

AP Precalculus

Name: _____ Score: _____

1. A function is **increasing** on an interval when...

- ☐ as the input increases, the output decreases
- ☐ the graph is a straight line
- ☐ the output is a large number
- ☐ as the input increases, the output increases

2. The **average rate of change** of f over the interval $[a, b]$ equals...

- ☐ $b - a$
- ☐ $\frac{f(b) - f(a)}{b - a}$
- ☐ $f(b) - f(a)$
- ☐ $\frac{f(b)}{f(a)}$

3. The average rate of change of a **linear function** over any interval is...

- ☐ always the same (constant)
- ☐ impossible to find
- ☐ always increasing
- ☐ always zero

4. A zero where the graph just **touches** the x-axis (instead of crossing) has an even _____.

5. An **odd-degree** polynomial with a **positive** leading coefficient...

- ☐ rises on both ends
- ☐ falls on the left, rises on the right
- ☐ rises on the left, falls on the right
- ☐ falls on both ends

6. A fraction equals **zero** exactly when...

- ☐ neither is 0
- ☐ the numerator is 0
- ☐ both are 0
- ☐ the denominator is 0

7. If a value makes **both** the numerator and denominator zero, there may be a hole instead of a vertical asymptote.

- ☐ True ☐ False

8. Polynomial long division rewrites a rational expression as a quotient plus a _____ over the denominator.

9. Multiplying the whole function by -1 , giving $-f(x)$, produces a _____ across the x-axis.

10. Predicting a value **between** known data points is called _____.

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Answers ·

AP Precalculus

1. as the input increases, the output increases

Increasing is about **direction**, not size: move right along the input and the output climbs. It can be increasing while its values are still negative.

2. $\frac{f(b) - f(a)}{b - a}$

It is the **change in output** divided by the **change in input** – a ratio, so it carries units of output per unit of input.

3. always the same (constant)

A straight line has one fixed slope, so the average rate of change is the same over *every* interval – that is what makes it linear.

4. multiplicity

Even **multiplicity** (like $(x - 3)^2$) makes the curve bounce off the axis; odd multiplicity makes it cross.

5. falls on the left, rises on the right

Odd degree makes the ends point *opposite* ways; a positive lead sends the right end up (and so the left end down).

6. the numerator is 0

A fraction is zero only when its top is zero (and its bottom is not). $\frac{0}{5} = 0$, but $\frac{5}{0}$ is undefined.

7. True

A shared factor cancels, so that input gives a hole (removable). A vertical asymptote needs the denominator zero to survive.

8. remainder

$\frac{\text{top}}{\text{bottom}} = \text{quotient} + \frac{\text{remainder}}{\text{bottom}}$ – the form that reveals asymptotic behavior.

9. reflection

A negative on the outside flips every output's sign, mirroring the graph across the x-axis.

10. interpolation

Interpolation stays inside the data range, so it is usually reliable.