

1. If $f(x)$ is a linear function $f(2)=1$ and $f(4)=-2$, then $f(x)=$

(a) $f(x)=-\frac{3}{2}x+4$

(b) $f(x)=\frac{3}{2}x-2$

(c) $f(x)=-\frac{3}{2}x+2$

(d) $f(x)=\frac{3}{2}x-4$

(e) $f(x)=-\frac{2}{3}x+\frac{7}{3}$

2. An equation for the line through the point $(1, -2)$ and parallel to the line with the equation $3x - 2y = 5$ is

(a) $3x - 2y = 7$

(b) $x - 2y = -3$

(c) $3x + 2y = 1$

(d) $2x + 3y = -4$

(e) $2x + 3y = -8$

3. Find the vertex of the parabola $5x^2 - 40x - y + 78 = 0$.

(a) $(-4, 2)$

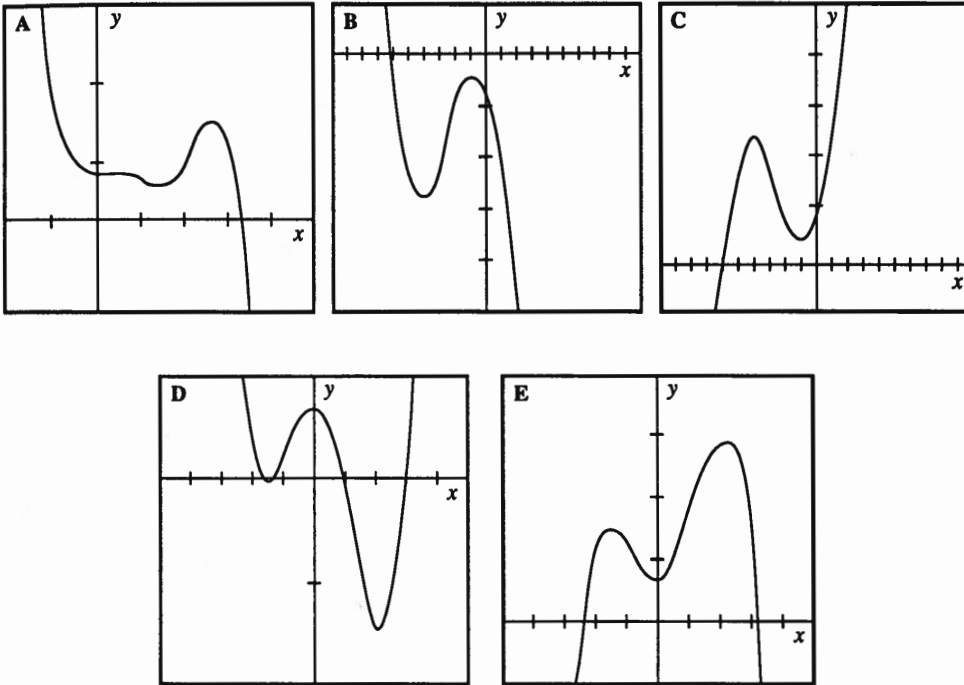
(b) $(-2, -4)$

(c) $(4, -2)$

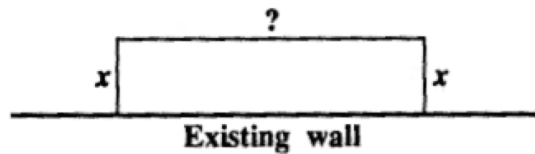
(d) $(2, -4)$

(e) $(4, 2)$

4. Which one of the following could represent a complete graph of $f(x) = -x^4 + px^3 + qx^2 + r$ where $p, q,$ and r are real numbers?



5. A rectangular field against an existing wall is surrounded on three sides by $160'$ of fence as shown in the figure below. Write an equation for the *area A of the enclosure* as a function of the length x .



- (a) $A(x) = 160 - 2x^2$
- (b) $A(x) = 160x$
- (c) $A(x) = 2x + 80$
- (d) $A(x) = 80x - 2x^2$
- (e) $A(x) = 160x - 2x^2$

6. Find the polynomial of degree 3 whose zeros are $(-3, 0)$, $\left(\frac{3}{2}, 0\right)$ and $(2, 0)$.

(a) $f(x) = 2x^3 - x^2 - 15x - 18$

(b) $f(x) = 2x^2 + 3x - 9$

(c) $f(x) = 2x^2 - 7x + 6$

(d) $f(x) = 2x^3 - x^2 - 15x + 18$

(e) $f(x) = 2x^3 - 7x^2 - 15x + 18$

7. Determine the sign pattern for $f(x) = 2x^4 - 2x^3 - 4x^2$.

(a)
$$\begin{array}{cccccc} & + & 0 & - & 0 & - & 0 & + \\ y & & & & & & & \\ x & \longleftarrow & -1 & & 0 & & 2 & \longrightarrow \end{array}$$

(b)
$$\begin{array}{cccccc} & - & 0 & + & 0 & - & 0 & + \\ y & & & & & & & \\ x & \longleftarrow & -1 & & 0 & & 2 & \longrightarrow \end{array}$$

(c)
$$\begin{array}{cccccc} & + & 0 & - & 0 & + & 0 & - \\ y & & & & & & & \\ x & \longleftarrow & -1 & & 0 & & 2 & \longrightarrow \end{array}$$

(d)
$$\begin{array}{cccccc} & - & 0 & + & 0 & + & 0 & - \\ y & & & & & & & \\ x & \longleftarrow & -1 & & 0 & & 2 & \longrightarrow \end{array}$$

(e)
$$\begin{array}{cccccc} & + & 0 & + & 0 & + & 0 & + \\ y & & & & & & & \\ x & \longleftarrow & -1 & & 0 & & 2 & \longrightarrow \end{array}$$

Honors Precalculus '15-16

PreCalc Basics

Round to 3 decimal places.

Show all work.

Name: _____

score _____

1. Show the sign patterns for

$$y = -2x(3x - 4)^2(x + 5)$$

$$y = (3 - x)^2(x + 2)(x - 1)$$

2. Find the zeros of $y = 3x^4 + 11x^3 + 11x^2 + 55x - 20$ by calculator and prove it by synthetic division.

3. Use your graphing calculator to find **and sketch** a complete graph of $f(x) = -x^4 - 10x^3 + 5x^2 + 12x + 1$. State the window used, find the zeros, and the extreme points.

Window:

Zeros:

Extreme Points:

4. Use synthetic division to find $f\left(-\frac{1}{3}\right)$ if $f(x) = 9x^3 - 7x + 3$.

PreCalc Basics**NO CALCULATOR ALLOWED****Show all work.**

5. Find an inequality that has this sign pattern and solution:

$$\begin{array}{c} y \\ x \end{array} \leftarrow \begin{array}{ccccccc} & - & 0 & + & 0 & + & 0 & - \\ & & -2 & & \frac{1}{3} & & 5 & \end{array} \rightarrow \text{ and } x \in (-\infty, -2] \cup \left\{ \frac{1}{3} \right\} \cup [5, \infty)$$

6. Simplify the following expression:

(a)
$$\frac{x^3 - 2x^2 + 4x - 8}{x^4 - 16}$$

(b)
$$y = \frac{x^2 + 5x}{x^2 + 6x + 5} \div \frac{x^3}{3x + 3} \cdot \frac{x}{x + 1}$$

7. Show the sign pattern and solve $3x^4 + 11x^3 + 11x^2 + 55x - 20 < 0$. (note: this is the polynomial from #2 above)

8. Show the sign pattern and solve $2x^3 - 5x^2 - 18x + 45 \geq 0$