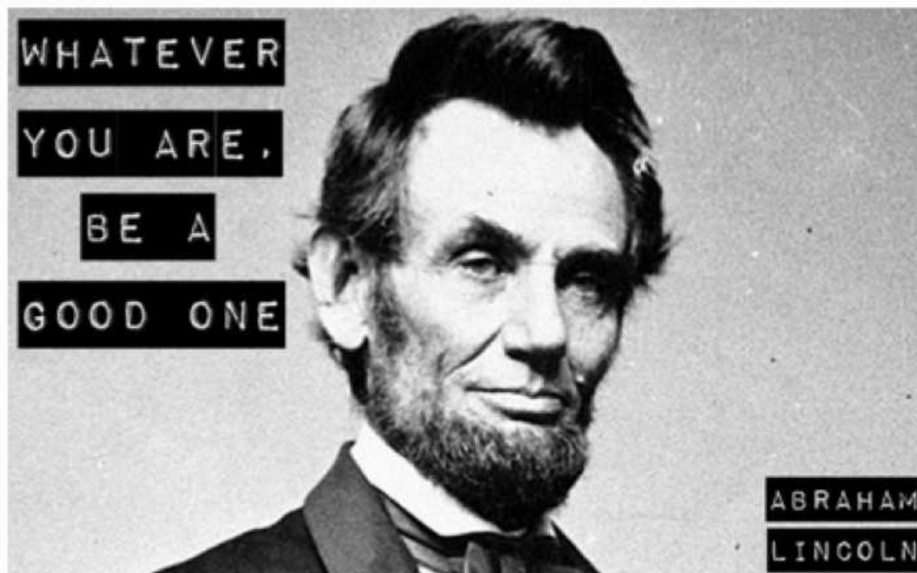


Sketching Polynomial Functions



HW:

To sketch a polynomial function you will need...

1. x-intercepts
2. y-intercept
3. end behavior
4. table of values

Sketching WS
and
1-19 odd
Ch 2 Rev.

ex: Sketch.

a) $y = 9x^3 + 18x^2 - x - 2$

x-int.

$$0 = (3x - 1)(3x + 1)(x + 2)$$

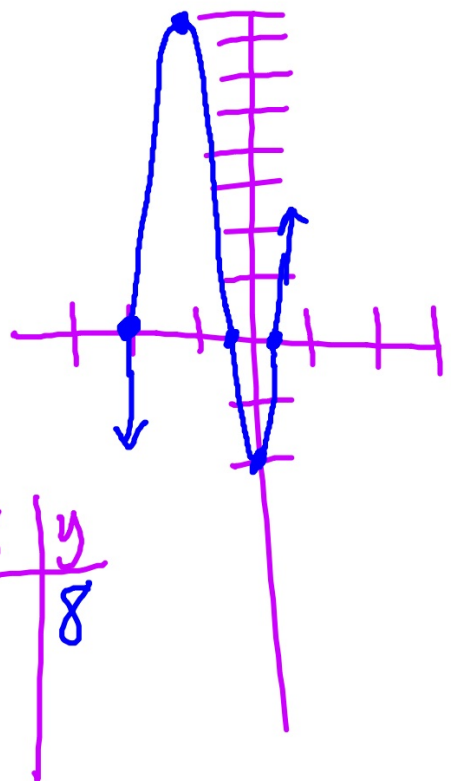
$$x = \frac{1}{3}, -\frac{1}{3}, -2$$

All cross

y-int (0, -2)

E.B.
 $x \rightarrow -\infty \quad y \rightarrow -\infty$
 $x \rightarrow \infty \quad y \rightarrow \infty$
↙ ↗

| x | y |
|----|---|
| -1 | 8 |



ex: Sketch.

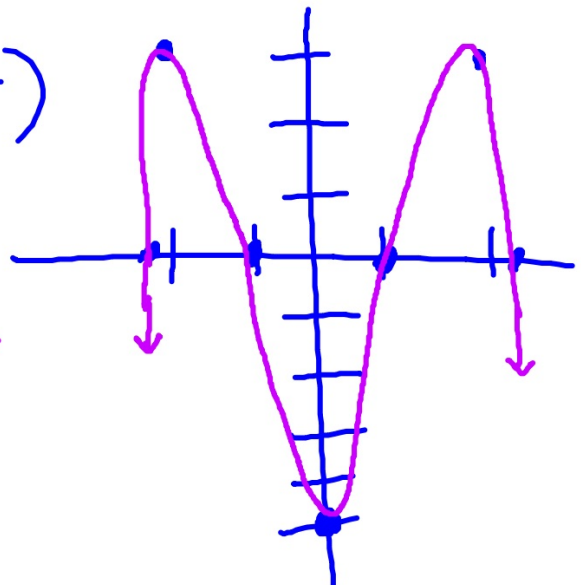
b) $f(x) = -x^4 + 6x^2 - 5$

x-int $0 = -(x^4 - 6x^2 + 5)$
 $0 = -(x^2 - 5)(x^2 - 1)$
 $x = \pm 1, \pm \sqrt{5}$
all cross

y-int $(0, -5)$

E.B. $x \rightarrow -\infty \quad y \rightarrow -\infty$
 $x \rightarrow \infty \quad y \rightarrow -\infty$
↙ ↘

| x | y |
|----|---|
| -2 | 3 |
| 2 | 3 |



ex: Sketch.

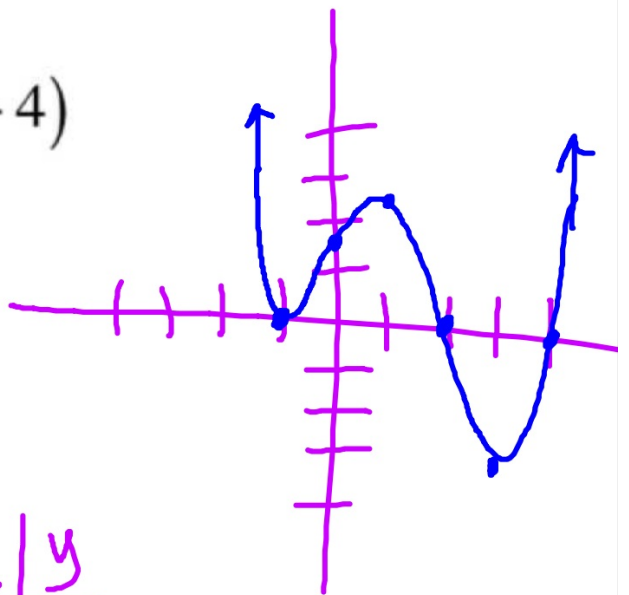
$$c) f(x) = \frac{1}{5}(x+1)^2(x-2)(x-4)$$

xint $x = -1, x = 2, x = 4$
bounce cross cross

yint $(0, 8/5)$

E.B. $x \rightarrow -\infty y \rightarrow \infty$
 $x \rightarrow \infty y \rightarrow \infty$

| x | y |
|---|-------|
| 1 | 12/5 |
| 3 | -16/5 |



ex: Sketch.

d) $y = -x^3 + 1$

ex: Sketch.

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

ex: Sketch.

$$f) g(x) = x^3 - 3x^2 + 2$$

ex: Sketch a polynomial function with the given characteristics.

- $x \rightarrow -\infty, y \rightarrow -\infty$
- $x \rightarrow \infty, y \rightarrow \infty$
- 1 negative crossing zero
- 1 positive bouncing zero

REVIEW

ex: Solve.

a) $3 - 81x^3 = 0$

REVIEW

ex: Solve.

b) $x^3 - 8x^2 + 5x + 14 = 0$

REVIEW

ex: Solve.

c) $4x^4 + 34x^2 + 16 = 0$

REVIEW

ex: $f(x) = x^3 - 7x^2 + 7x$

Find $5f(4)$ using synthetic substitution.

REVIEW

ex: $f(x) = x^4 - 2x^3 + 3x^2 - 8x - 4$

If $f(1 + \sqrt{2}) = 0$ find all zeros of $f(x)$.

REVIEW

ex: Simplify.

$$\frac{(3x^2y^4z^0)^{-1}}{(2xy^0z)^{-2}(3x^{-1}y^2)}$$

REVIEW

ex: Sketch.

$$y = x^3 - x^2 - 4x + 4$$

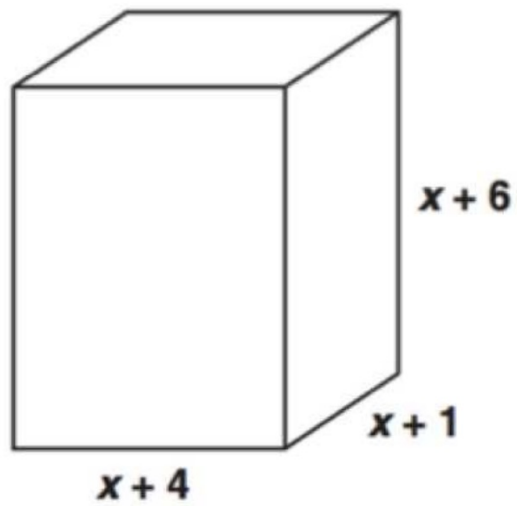
REVIEW

ex: $7^8 - 5x^4 - 6x$

- a) Write in standard form.
- b) Classify by degree and number of terms.
- c) State the end behavior.

REVIEW

ex: What is the volume of the figure below?



REVIEW

ex: $2x + 7 \overline{) 2x^4 + 21x^3 + 35x^2 - 37x + 46}$

REVIEW

ex:

**Which polynomial represents
 $(3x^2 + x - 4)(2x - 5)$?**

A $6x^3 - 13x^2 - 13x - 20$

B $6x^3 - 13x^2 - 13x + 20$

C $6x^3 + 13x^2 + 3x - 20$

D $6x^3 + 13x^2 + 3x + 20$

REVIEW

ex:

$$(-2x^2 + 6x + 1) - 2(4x^2 - 3x + 1) =$$

A $6x^2 - 1$

B $-10x^2 - 1$

C $6x^2 + 12x - 1$

D $-10x^2 + 12x - 1$

REVIEW

ex:

$$8a^3 + c^3 =$$

- A** $(2a + c)(2a + c)(2a + c)$
- B** $(2a - c)(4a^2 + 2ac + c^2)$
- C** $(2a - c)(4a^2 + 4ac + c^2)$
- D** $(2a + c)(4a^2 - 2ac + c^2)$

REVIEW

ex:

What is the simplest form of
 $\frac{5x^3y + 20x^2y^2 + 20xy^3}{5xy}$?

- A** $(x + 2)^2$
- B** $(x + 2y)^2$
- C** $x^2 + y^2$
- D** $x^2 + 4y^2$