LESSON 24

MA 16100 · FALL 2022

DR. HOOD

WARM UP

Find the inflection point(s) of the function

$f(x) = e^{-x^2}$

a) $x = 0$

b) $x = \frac{1}{\sqrt{2}}$ and $x = -\frac{1}{\sqrt{2}}$

c) There are no inflection points

$f''(x) = 0$

$f'(x) = e^{-x^2}(-2x)$

$f''(x) = [e^{-x^2}(-2x)](-2x) + e^{-x^2}(-2)$

$= [4x^2 - 2]e^{-x^2} = 0$

$4x^2 - 2 = 0$

$4x^2 = 2$

$\sqrt{x^2} = \sqrt{\frac{1}{2}}$

$x = \pm\frac{1}{\sqrt{2}}$

ANNOUNCEMENTS

- Dr. Hood's Office Hours in Math 844
  - Mon and Wed at 3:30-4:30pm
  - Friday at 2:30-3:30pm

- TA's Office Hours in the Math Resource Room
  - WTHR 313
  - Mon – Thu from 9:30am – 8:30pm
  - Fri from 9:30am – 3:30pm

EXAM 2 GRADES

- Average: 69
- Median: 76
- Almost all scores updated in Brightspace Gradebook
- Exam Booklets returned next week

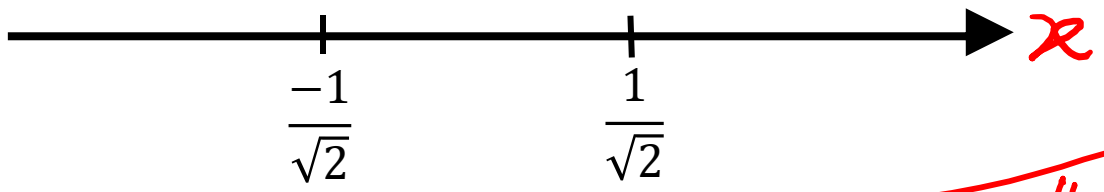
Exam 2 Score	Percent of students
90 – 100	26%
80 – 89.9	13%
70 – 79.9	11%
60 – 69.9	19%
0 – 59.9	30%

POLL 1

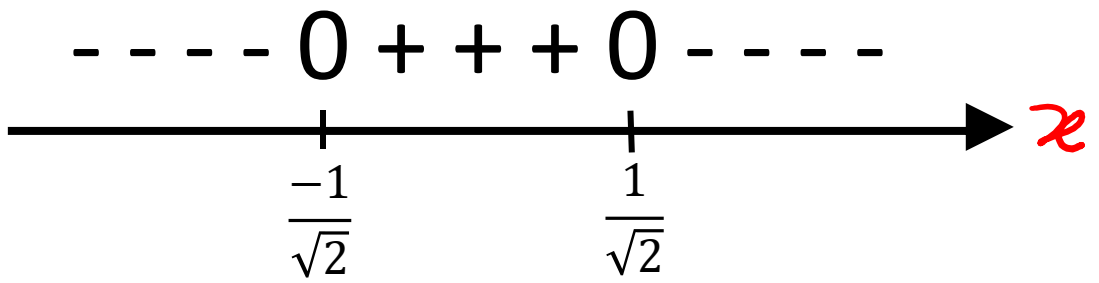
Draw a chart of the sign of:

$$f''(x) = (4x^2 - 2)e^{-x^2}$$

a) + + + 0 - - - - 0 + + +



b) - - - - 0 + + + 0 - - - -

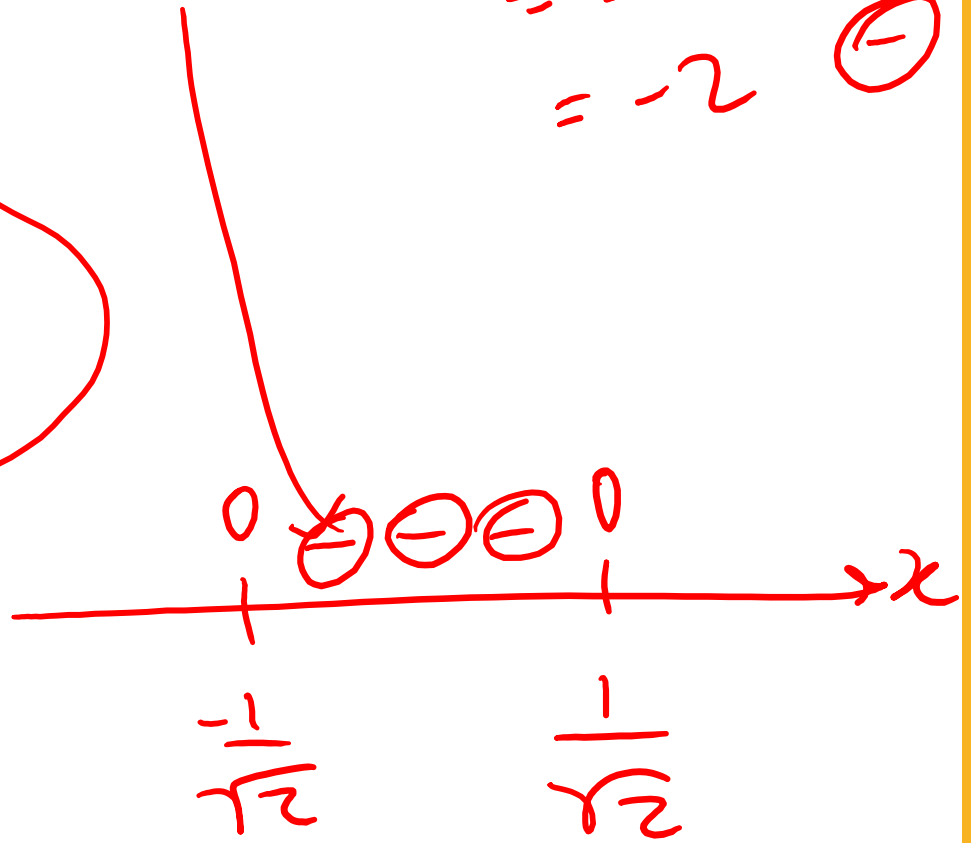


check $x=0$

$f''(0) = (4\cdot 0^2 - 2)e^{-0^2}$

$= -2 \cdot e^0$

$= -2$ ⊖



POLL 2

Find the vertical asymptotes (VA) and horizontal asymptotes (HA) of the function $y = e^{-x^2}$

a) VA: None and HA: $y = 0$

b) VA: $x = 0$ and HA: $y = 0$

c) VA: $x = 0$ and HA: None

VA: $y = e^{-x^2} = \frac{1}{e^{x^2}}$

is there x $e^{x^2} = 0$

NO

No VA

$\lim_{x \to \infty} e^{-x^2}$

$= \lim_{x \to \infty} \frac{1}{e^{x^2}} = 0$

HA at $x = 0$

POLL 3

Let $f'(x) = 4\cos(x)$.
Using the First Derivative Test, which of these is a possible graph of $f(x)$

a) I only

b) I and III only

c) I, II, and III