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Soal UTS Matematika!

- Buatlah grafik fungsi dari
  a) $2x^2 - 4x + 5$
  b) $2x^2 - 7x - 5$
  c) $x^2 + 3x + 2$
- Diketahui $F(x) = x - 2$ dan $g(x) = 4 - x^2$ tentukan
  a). $(g \cdot F)(2)$
  b). $(F \circ g)(-2)$

No 1 (b) grafik fungsi!

b) $2x^2 - 7x - 5$

$y = 2x^2 - 7x - 5$

$D = b^2 - 4ac$

$= (-7)^2 - 4(2)(-5)$

$= 49 - 40$

$D = 9$

$\Rightarrow x_{1,2} = \frac{-b \pm \sqrt{D}}{2a}$

$= \frac{-(-7) \pm \sqrt{9}}{2(2)}$

$= \frac{7 \pm 3}{4}$

$x_1 \Rightarrow \frac{7+3}{4} = \frac{10}{4} = 2\frac{5}{2} = 2\frac{1}{2}$

$x_2 \ \frac{7-3}{4} = \frac{4}{4} = 1$

- Titik potong sumbu x
  $(2\frac{1}{2}, 0)\ (1, 0)$
- titik potong sumbu y
  $(0, 5)$
- sumbu simetri
  $x_p = -b/2a$
  $= -(-7)/2(2)$
  $= 7/4$
  $= 1\frac{3}{4}$

- titik puncak
  $y_p(1\frac{3}{4}) = 2(1\frac{3}{4})^2 - 7(1\frac{3}{4})^2 - 5$
  $= \frac{-89}{8}$
  $= -11\frac{1}{8}$

No 2 (a) fungsi komposisi!

a) $(g \circ f)(x) = g(f(x))$

$g(f(x)) = 4 - (f(x))^2$

$g(x-2) = 4 - (x-2)^2$

$g(f(x)) = 4 - (x^2 - 4x + 4)$

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

$= -x^2 + 4x$

$= -(2)^2 + 4(2)$

$= -4 + 8$

$= 4$

No 1 grafik fungsi

a) $2x^2 - 4x + 5$

$y = 2x^2 - 4x + 5$

$D = b^2 - 4ac$

$= (-4)^2 - 4(2)(5)$

$= 16 - 40$

$= -24$

$\Rightarrow x_{1,2} = \frac{-b \pm \sqrt{D}}{2a}$

$= \frac{-(-4) \pm (-\sqrt{24})}{2(2)}$

$= \frac{4 \pm (-2\sqrt{6})}{4}$

$x_1 \Rightarrow \frac{4 + (-2\sqrt{6})}{4}$

$= \frac{4 - 2\sqrt{6}}{4}$

$= 1 \cdot 2\sqrt{6}$

$x_2 \Rightarrow \frac{4 - (-2\sqrt{6})}{4}$

$= \frac{4 + 2\sqrt{6}}{4}$

$= 12\sqrt{6}$

- titik potong sumbu x $(1-2\sqrt{6}, 0), (12\sqrt{6}, 0)$
- titik potong sumbu y $(0, 5)$
- sumbu simetri

$x_p = -b/2a$

$= -(-4)/2(2)$

$= 4/4$

$= 1$

- titik puncak

$y_p(1) = 2(1)^2 - 4(1) + 5$

$= 2 - 4 + 5$

$= 3$

titik puncak $(1, 3)$

No 2 Fungsi komposisi!

b) $(Fog)(x) = F(g(x))$

$F(g\text{-}x') = (g(x))/-2$

$= (4 - x^2) - 2$

$= -8 + 2x^2$

$(Fog)(-2) = -8 + 2x^2$

$= -8 + 2(-2)^2$

$= -8 + 2.4$

$= -8 + 8$

$= 0$

c) $x^2 + 3x + 2$

$(x+1)(x+2)$

$x+1=0 \mid x+2=0$

$x=-1 \mid x = -2$

x	y
-1	0
-2	0

Range $(-1,0), (-2,0)$

$y_1 = (-1)^2 + 3(-1) + 2$

$= 1 + (-3) + 2$

$= 0$

$y_2 = (-2)^2 + 3(-2) + 2$

$= 4 + -6 + 2$

$= 0$