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R2

Soal 1

Tulislah ekspresi ekuivalen tanpa eksponen negatif dari

$$\left(\frac{24a^{10}b^{-8}c^7}{12a^6b^{-3}c^5} \right)^{-5}$$

```
>$& ((24*a^(10)*b^(-8)*c^7)/(12*a^6*b^(-3)*c^5))^(-5)
```

$$\frac{b^{25}}{32a^{20}c^{10}}$$

Soal 2

Tulislah ekspresi ekuivalen tanpa eksponen negatif dari

$$\left(\frac{125p^{12}q^{-14}r^{22}}{25p^8q^6r^{-15}} \right)^{-4}$$

```
>$& ((125*p^(12)*q^(-14)*r^(22))/(25*p^8*q^6*r^(-15)))^(-4)
```

$$\frac{q^{80}}{625p^{16}r^{148}}$$

Soal 3

Hitunglah hasil dari

$$\frac{4(8-6)^2 - 4.3 + 2.8}{3^1 + 19^0}$$

```
>(4*(8-6)^2-4*3+2*8)/(3^1+19^0)
```

Soal 4

Hitunglah hasil dari

$$\frac{[4(8 - 6)^2 + 4](3 - 2.8)}{2^2(2^3 + 5)}$$

```
> ( (4 * (8-6) ^2+4) * (3-2*8) ) / ( (2^2) * (2^3+5) )
```

-5

Soal 5

Sederhanakan. Asumsikan bahwa semua eksponen adalah bilangan bulat, semua penyebut bukan nol, dan nol tidak dipangkatkan ke pangkat nonpositif.

$$(m^{x-b} \cdot n^{x+b})^x (m^b n^{-b})^x$$

```
> $ (m^(x-b) * n^(x+b) ) ^x * (m^b * n^(-b) ) ^x
```

$$\left(\frac{m^b}{n^b}\right)^x (m^{x-b} n^{x+b})^x$$

R3

Soal 1

Lakukan operasi yang ditunjukkan.

$$(x + 6)(x + 3)$$

```
> $&showev ('expand((x+6) * (x+3) ) )
```

$$\text{expand}((x + 3)(x + 6)) = x^2 + 9x + 18$$

Soal 2

Lakukan operasi yang ditunjukkan.

$$(3a^2)(-7a^4)$$

```
> $&showev ('expand((3*a^2) * ((-7) * a^4) ) )
```

$$\text{expand}(-21 a^6) = -21 a^6$$

Soal 3

Lakukan operasi yang ditunjukkan.

$$(x + 1)(x - 1)(x^2 + 1)$$

```
>$showev ('expand((x+1)*(x-1)*(x^2+1))')
```

$$\text{expand}((x - 1)(x + 1)(x^2 + 1)) = x^4 - 1$$

Soal 4

Lakukan operasi yang ditunjukkan.

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

```
>$showev ('expand((2*x+3*y+4)*(2*x+3*y-4))')
```

$$\text{expand}((3y + 2x - 4)(3y + 2x + 4)) = 9y^2 + 12xy + 4x^2 - 16$$

Soal 5

Lakukan operasi yang ditunjukkan.

$$(-5m^4n^2)(6m^2n^3)$$

```
>$showev ('expand((-5)*m^4*n^2)*(6*m^2*n^3)')
```

$$\text{expand}(-30m^6n^5) = -30m^6n^5$$

R4

Soal 1

Faktorkan selisih kuadrat dari

$$m^2 - 4$$

```
> $factor(m^2-4)
```

$$(m - 2)(m + 2)$$

Soal 2

Faktorkan selisih kuadrat dari

$$16x^2 - 9$$

```
>$factor(16*x^2-9)
```

$$(4x - 3)(4x + 3)$$

Soal 3

Faktorkan kuadrat binomial dari

$$y^2 - 6y + 9$$

```
>$factor(y^2-6*y+9)
```

$$(y - 3)^2$$

Soal 4

Faktorkan kuadrat binomial dari

$$1 + 10x + 25x^2$$

```
>$factor(1+(10)*x+(25)*x^2)
```

$$(5x + 1)^2$$

Soal 5

Faktorkan jumlah atau selisih pangkat tiga dari

$$250z^4 - 2z$$

```
>$factor(250*z^4-2*z)
```

$$2z(5z - 1)(25z^2 + 5z + 1)$$

Soal 6

Faktorkan jumlah atau selisih pangkat tiga dari

$$27x^6 - 8$$

```
>$factor((27)*x^6-8)
```

$$(3x^2 - 2)(9x^4 + 6x^2 + 4)$$

Soal 7

Faktor sepenuhnya dari

$$18a^2b - 15ab^2$$

```
>$factor(18*a^2*b-15*a*b^2)
```

$$-3ab(5b - 6a)$$

Soal 8

Faktor sepenuhnya dari

$$125a - 8a^4$$

```
>$factor(125*a-8*a^4)
```

$$-a(2a - 5)(4a^2 + 10a + 25)$$

Soal 9

Tentukan faktor dari

$$6(2p + q)^2 - 5(2p + q) - 25$$

```
>$factor(6*(2*p+q)^2-5*(2*p+q)-25)
```

$$(2q + 4p - 5)(3q + 6p + 5)$$

Soal 10

Faktor. Asumsikan bahwa variabel dalam eksponen mewakili bilangan asli.

$$bdy^2 + ady + bcy + ac$$

```
>$factor(b*d*y^2+a*d*y+b*c*y+a*c)
```

$$(by + a)(dy + c)$$

Soal 1
Selesaikan

$$7(3x + 6) = 11 - (x + 2)$$

```
>$&solve(7*(3*x+6)=11-(x+2))
```

$$\left[x = -\frac{3}{2} \right]$$

Soal 2
Selesaikan

$$(5x^2 + 6x)(12x^2 - 5x - 2) = 0$$

```
>$&solve((5*x^2+6*x)*(12*x^2-5*x-2))
```

$$\left[x = -\frac{1}{4}, x = \frac{2}{3}, x = -\frac{6}{5}, x = 0 \right]$$

Soal 3
Selesaikan

$$n^2 + 4n + 4 = 0$$

```
>$&solve(n^2+4*n+4=0)
```

$$[n = -2]$$

Soal 4
Selesaikan

$$y^2 + 25 = 10y$$

```
>$&solve(y^2+25=10*y)
```

$$[y = 5]$$

Soal 5
Selesaikan

$$3(2n - 5) - 7 = 4(n - 9)$$

```
>$&solve(3*(2*n-5)-7=4*(n-9))
```

$$[n = -7]$$

R6

Soal 1
Sederhanakan

$$\frac{x^2 - 4}{x^2 - 4x + 4}$$

```
>$& diff((x^2-4)/(x^2-4*x+4),x) | ratsimp
```

$$-\frac{4}{x^2 - 4x + 4}$$

Soal 2
Sederhanakan

$$\frac{6 - x}{x^2 - 36}$$

```
>$& diff((6-x)/(x^2-36),x) | ratsimp
```

$$\frac{1}{x^2 + 12x + 36}$$

Soal 3
Kalikan atau bagi dan, jika memungkinkan, sederhanakan.

$$\frac{r - s}{r + s} \cdot \frac{r^2 - s^2}{(r - s)^2}$$

```
>$& ((r-s)/(r+s))*((r^2-s^2)/((r-s)^2))
```

$$\frac{r^2 - s^2}{(r - s)(s + r)}$$

Soal 4

Tambahkan atau kurangi dan, jika memungkinkan, sederhanakan.

$$\frac{7}{5x} + \frac{3}{5x}$$

```
>$ (7)/(5*x) + (3)/(5*x)
```

$$\frac{2}{x}$$

Soal 5

Sederhanakan

$$\frac{(x+h)^2 - x^2}{h}$$

```
>$ diff(((x+h)^2-x^2)/(h),h) | ratsimp
```

$$1$$

2.3 Exercise Set

Diketahui:

$$f(x) = 3x + 1$$

$$g(x) = x^2 - 2x - 6$$

$$h(x) = x^3$$

```
>function f(x):=3*x+1;
>function g(x):=x^2-2*x-6;
>function h(x):=x^3;
```

tentukan masing-masing dari berikut ini

Soal 1

$$(f \circ g)(-1)$$

```
>f(g(x))
```


Soal 2

$$(h \circ f)(1)$$

>h (f (1))

64

Soal 3

$$(g \circ f)(5)$$

>g (f (5))

218

Soal 4

$$(f \circ h)(-3)$$

>f (h (-3))

-80

Soal 5

$$(g \circ g)(-2)$$

>g (g (-2))

-6

Soal 6

$$(h \circ h)(2)$$

>h (h (2))

512

Soal 7

$$(f \circ f)(4)$$

>f(f(4))

40

3.1 Exercise Set

Soal 1

Sederhanakan. Tulis jawaban dalam bentuk $a + bi$, di mana a dan b adalah bilangan riil.

$$(10 + 7i) - (5 + 3i)$$

>\$ (10+7*i) - (5+3*i)

$$4i + 5$$

Soal 2

Sederhanakan. Tulis jawaban dalam bentuk $a + bi$, di mana a dan b adalah bilangan riil.

$$(13 + 9i) - (8 + 2i)$$

>\$ (13+9*i) - (8+2*i)

$$7i + 5$$

Soal 3

Sederhanakan. Tulis jawaban dalam bentuk $a + bi$, di mana a dan b adalah bilangan riil.

$$(6 - 4i) - (-5 + i)$$

>\$ (6-4*i) - (-5+i)

$$11 - 5i$$

Soal 4

Sederhanakan.

$$\sqrt{-4} \cdot \sqrt{-36}$$

>\$ (sqrt(-4)) * (sqrt(-36))

$$-12$$

Soal 5
Sederhanakan.

$$\sqrt{-49} \cdot \sqrt{-9}$$

```
>$&(sqrt(-49))* (sqrt(-9))
```

$$-21$$

3.4 Exercise Set

Soal 1
Selesaikan.

$$\frac{1}{2} + \frac{2}{x} = \frac{1}{3} + \frac{3}{x}$$

```
>$&solve(1/2+2/x=1/3+3/x)
```

$$[x = 6]$$

Soal 2
Selesaikan.

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

```
>$&solve(2/(x-1)=3/(x+2))
```

$$[x = 7]$$

Soal 3
Selesaikan.

$$\frac{1}{3x+6} - \frac{1}{x^2-4} = \frac{3}{x-2}$$

```
>$&solve((1/(3*x+6)) - (1/(x^2-4)) = (3/(x-2)))
```

$$\left[x = -\frac{23}{8} \right]$$

Soal 4
Selesaikan.

$$\sqrt{3x-4} = 1$$

```
>$solve(\sqrt{3*x-4})
```

$$\left[x = \frac{4}{3} \right]$$

Soal 5
Selesaikan.

$$\sqrt{7-x} = 2$$

```
>$solve(\sqrt{7-x}=2)
```

$$[x = 3]$$

3.5 Exercise Set

Soal 1
Selesaikan.

$$|x+3| - 2 = 8$$

```
>&load(fourier_elim)
```

```
C:/Program Files/Euler x64/maxima/share/maxima/5.35.1/share/f\
ourier_elim/fourier_elim.lisp
```

```
>$fourier_elim([x+3 - 2=8],[x])
```

$$[x = 7]$$

Soal 2
Selesaikan.

$$5 - |4x+3| = 2$$

```
>$fourier_elim([5 - 4*x+3=2],[x])
```

$$\left[x = \frac{3}{2} \right]$$

Soal 3
Selesaikan.

$$|2x| \geq 6$$

```
>$fourier_elim([2*x>=6],[x])
```

$$[x = 3] \vee [3 < x]$$

Soal 4
Selesaikan.

$$|4x| > 20$$

```
>$fourier_elim([4*x>20],[x])
```

$$[5 < x]$$

Soal 5
Selesaikan.

$$\left| x + \frac{3}{4} \right| < \frac{1}{4}$$

```
>$fourier_elim([x+3/4<1/4],[x])
```

$$\left[x < -\frac{1}{2} \right]$$

4.1 Exercise Set

Soal 1

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

```
>$factor(x^2-5*x+6)^2
```

$$(x - 3)^2 (x - 2)^2$$

Soal 2

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

```
>$&factor(x^4-4*x^2+3)
```

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

Soal 3

$$f(x) = 3x^3 + x^2 - 48x - 16$$

```
>$&factor(3*x^2+x^2-48*x-16)
```

$$4 (x^2 - 12x - 4)$$

Soal 4

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

```
>$&factor(x^3-x^2-2*x+2)
```

$$(x - 1) (x^2 - 2)$$

Soal 5

$$f(x) = x^4 - 10x^2 + 9$$

```
>$&factor(x^4-(10)*x^2+9)
```

$$(x - 3) (x - 1) (x + 1) (x + 3)$$

4.3 Exercise Set

Soal 1

Diketahui:

$$f(x) = x^3 - 6x^2 + 11x - 6$$

Temukan $f(1)$, $f(-2)$, dan $f(3)$

```
>function f(x) :=x^3-6*x^2+11*x-6;  
>f(1)
```

0

```
>f(-2)
```

-60

```
>f(3)
```

0

Soal 2

Diketahui:

$$f(x) = x^3 + 7x^2 - 12x - 3$$

Temukan $f(-3)$, $f(-2)$, dan $f(1)$

```
>function f(x) :=x^3+7*x^2-12*x-3;  
>f(-3)
```

69

```
>f(-2)
```

41

```
>f(1)
```

-7

Soal 3

Diketahui:

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

Temukan $f(-1)$, $f(4)$, dan $f(-5)$

```
>function f(x) :=x^4-3*x^3+2*x+8;  
>f(-1)
```

10

```
>f(4)
```

80

```
>f(-5)
```

998

Soal 4

Diketahui:

$$f(x) = x^5 + 32$$

Temukan $f(2)$, $f(-2)$, dan $f(3)$

```
>function f(x) :=x^5+32;  
>f(2)
```

64

```
>f(-2)
```

0

```
>f(3)
```

275

Soal 5

Diketahui:

$$f(x) = x^4 - 16$$

Temukan $f(2)$, $f(-2)$, $f(3)$, dan $f(1-2^{1/2})$

```
>function f(x):=x^4-16;  
>f(2)
```

0

```
>f(-2)
```

0

```
>f(3)
```

65

```
>f(1-sqrt(2))
```

-15.9705627485