Graad 9

Totaal: 95
Tyd: 2 uur

November Eksamen Vraestel 1 2022-Memorandum

Vraag 1

1.1 Gegee: $y = \sqrt{\frac{2x}{x+2}}$; $x\epsilon\ (-2; 0; 2; 4)$

1.1.1 Vir watter waarde(s) van x sal $y = 0$? (1)

$y = \sqrt{\frac{2(0)}{0+2}} = 0$
$\therefore x = 0\surd$

1.1.2 Vir watter waarde(s) van x sal y ongedefinieërd wees? (1)

$y = \sqrt{\frac{2(-2)}{-2+2}} =$ ongedefinieërd
$\therefore x = -2\surd$

1.1.3 Vir watter waarde(s) van x sal y 'n volkome vierkant wees? (1)

$y = \sqrt{\frac{2(2)}{2+2}} = 1$
$\therefore x = 2\surd$

1.1.4 Bepaal die waarde van x, indien $y^2 = \frac{1}{2}$. (4)

$\frac{2x}{x+2} = \frac{1}{2}\surd$
$4x\surd = x + 2\surd$
$3x = 2$
$x = \frac{2}{3}\surd$

1.2 Verdeel R6 880 tussen drie vriende, in die verhouding $1: 4: 5$. (3)

$6\,880 \times \frac{1}{10} = R688\ \surd$
$6\,880 \times \frac{4}{10} = R2\,752\ \surd$
$6\,880 \times \frac{5}{10} = R3\,440\ \surd$

1.3 Die prys van petrol styg met 8% tot R22,95 per liter. Wat was die prys van petrol voor die verhoging? (2)

$22{,}95 \times \frac{100}{108}\surd = R21{,}25\surd$

[12]

Vraag 2

2.1 Vereenvoudig, sonder die gebruik van 'n sakrekenaar, en laat alle antwoorde met positiewe eksponente.

2.1.1 $x^{10}.x^5$ (1)

$= x^{15}\surd$

2.1.2 $\sqrt[3]{\frac{27x^5}{8x^{-1}}}$ (3)

$= \sqrt[3]{\frac{27x^{6}\surd}{8}}$

$= \frac{3\surd x^{2}\surd}{2}$

2.1.3 $\frac{2x^4y^3+4x^4y^3}{(125x^{12}y^9)^{\frac{1}{3}}}$ (3)

$= \frac{6x^4y^3\surd}{5x^4y^3\surd}$

$= \frac{6}{5}\surd$

2.1.4 $\frac{5y^3-15y^2}{5y^2}$ (2)

$= y\surd-3\surd$

2.1.5 $\frac{3x+1}{3} - \frac{x-2}{4}$ (4)

$= \frac{12x+4\surd-3x+6\surd}{12\surd}$

$= \frac{9x+10\surd}{12}$

2.1.6 $\frac{16x^3y^2}{2xy^{-2}} \div \frac{2x^3}{y^3}$ (3)

$= \frac{16x^3y^2}{2xy^{-2}} \times \frac{y^3}{2x^3}$ $\surd$

$= \frac{16x^3y^7}{4x^4}$ $\surd$

$= \frac{4y^7}{x}$ $\surd$

[16]

Vraag 3

3.1 Vereenvoudig volledig:

3.1.1 $2(x+2y)$ (2)

$= 2x\surd+4y\surd$

3.1.2 $-x(x-y)+2x^2-(x)(-y)$ (3)

$= -x^2+xy\surd+2x^2+xy\surd$

$= x^2+2xy\surd$

3.1.3 $2(x-2)(x+3)$ (3)

$= 2(x^2 + 3x - 2x - 6)$ √
$= 2(x^2 + x$√$-6)$
$= 2x^2 + 2x - 12$√

3.1.4 $[2x - x^2(x^{-1} - 3y)]^2$ (4)

$= [2x - x + 3x^2y$√$]^2$
$= [x$√$+3x^2y]^2$
$= x^2 + 6x^3y$√$+9x^4y^2$√

3.1.5 $(x-1)(x+1) - 2(x-1)^2$ (5)

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

3.2 Indien $a + b = 3$ en $2ab = 4$, bepaal die waarde van $a^2 + b^2$. (4)

$(a+b)^2 = a^2 + 2ab$√$+b^2$√
$(3)^2 = a^2 + 4 + b^2$√
$5 = a^2 + b^2$√

[21]

Vraag 4

4.1 Faktoriseer volledig:

4.1.1 $4mn^2 + 2mn^3 - 16m^4n^3$ (1)

$= 2mn^2(2 + n - 8m^3n)$ √

4.1.2 $3x(y-3) - 27(3-y)$ (3)

$= 3x(y-3) + 27(y-3)$√
$= 3(y-3)$√$(x+9)$√

4.1.3 $4ab + 2a^2 - 6b - 3a$ (3)

$= 2a(2b + a)$√$-3(2b + a)$√
$= (2b + a)(2a - 3)$ √

4.1.4 $\sqrt{x^4} - 144$ (2)

$= x^2\sqrt{} - 144$
$= (x - 12)(x + 12)\sqrt{}$

4.1.5 $\frac{4a^2}{9} - 1$ (2)

$= (\frac{2a}{3} - 1)\sqrt{}(\frac{2a}{3} + 1)\sqrt{}$

4.1.6 $\frac{x^2}{2} - x - \frac{3}{2}$ (3)

$= \frac{1}{2}(x^2 - 2x - 3)\sqrt{}$
$= \frac{1}{2}(x - 3)\sqrt{}(x + 1)\sqrt{}$

4.1.7 $x^2(a - 2) + 2ax - 4x - 8(a - 2)$ (4)

$= x^2(a - 2) + 2x(a - 2)\sqrt{} - 8(a - 2)$
$= (a - 2)\sqrt{}(x^2 + 2x - 8)\sqrt{}$
$= (a - 2)(x - 2)(x + 4)\ \sqrt{}$

4.2 Vereenvoudig:

$\frac{x^2+2x-3}{3x+9} \times \frac{2x+8}{2(x+4)(x-1)}$ (4)

$= \frac{(x+3)(x-1)\sqrt{}}{3(x+3)\sqrt{}} \times \frac{2(x+4)\sqrt{}}{2(x+4)(x-1)}$
$= \frac{1}{3}\sqrt{}$

[22]

Vraag 5

5.1 Los op vir x:

5.1.1 $2(x - 2) = 3(x - 1) - (4x + 2)$ (4)

$2x - 4\sqrt{} = 3x - 3\sqrt{} - 4x - 2\sqrt{}$
$3x = -1$
$x = -\frac{1}{3}\sqrt{}$

5.1.2 $\frac{2}{x} + \frac{1}{2x} = 1\frac{3}{2}$ (3)

$\frac{4+1\sqrt{}}{2x} = \frac{5x\sqrt{}}{2x}$
$x = 1\sqrt{}$

5.1.3 $x^2 + 4x - 21 = 0$ (3)

$(x + 7)(x - 3) = 0$√
$x = -7$√ of $x = 3$√

5.1.4 $3.3^x = \frac{1}{81}$ (4)

3^{x+1}√ $= 3^{-4}$√
$x + 1 = -4$√
$x = -5$√

[14]

Vraag 6

6.1 Leslie belê R17 500 vir 4 jaar teen 'n saamgestelde rentekoers van 15%. Bereken die totale rente wat hy ná 4 jaar verdien het. (4)

$A = P(1 + i)^n$√
$A = 17\ 500(1 + \frac{15}{100})^4$ √
$A = R30\ 607{,}61$√
Rente verdien = $R13\ 107{,}61$√

6.2 Teen watter enkelvoudige rentekoers moet R50 000 belê word, vir 'n tydperk van 4 jaar, om te groei na R74 000? (4)

$A = P(1 + in)$ √
$74\ 000 = 50\ 000$√$(1 + i \times 4)$√
$i = \left(\frac{74000}{50000} - 1\right) \div 4 \times 100$
$i = 12\%$√

6.3 Indien $R1 = 0{,}049£$, hoeveel rand sal jy betaal vir 'n item van 350 pond? (2)

$1 \times \frac{350}{0{,}049}$√$= R7\ 142{,}86$√

[10]

Totaal:[95]