

Assignment 5 SOLUTIONS

MATH 171

Section 6.6

$$\#18 \quad \frac{a^2-a}{3a+9} \times \frac{a^2-9}{a^2-2a+1}$$

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

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

$$\#22 \quad \frac{4R^2-36}{R^3-25R} \times \frac{7R-35}{3R^2+9R}$$

$$= \frac{(2R+6)(2R-6)7(R-5)}{R(R^2-25)3R(R+3)}$$

$$= \frac{2(R+3)2(R-3)7(\cancel{R-5})}{R(R+5)(\cancel{R-5})3R}$$

$$= \frac{28(R+3)(R-3)}{3R^2(R+5)}$$

$$\#26 \quad \frac{S^4-11S^2+28}{S^2+3} \div \frac{S^2-4}{2S^2+3}$$

$$= \frac{(S^2-7)(\cancel{S^2-4})}{S^2+3} \times \frac{(2S^2+3)}{(\cancel{S^2-4})}$$

$$= \frac{(S^2-7)(2S^2+3)}{S^2+3}$$

#30 $\frac{n^2 + 5n}{3n^2 + 8n + 4} \times \frac{2n^2 - 8}{n^3 + 3n^2 - 10n}$

= $\frac{n(n+5)}{3n^2 + 6n + 2n + 4} \cdot \frac{2(n^2 - 4)}{n(n^2 + 3n - 10)}$

= $\frac{n(n+5)}{3n(n+2) + 2(n+2)} \cdot \frac{2(n-2)(n+2)}{n(n+5)(n-2)}$

= $\frac{\cancel{n(n+5)} \cdot 2 \cancel{(n-2)} \cancel{(n+2)}}{(3n+2) \cancel{(n+2)} \cancel{n(n+5)} \cancel{(n-2)}} = \frac{2}{3n+2}$

#36 $\frac{2x^2 - 5x - 3}{x-4} \times \left(\frac{x^2 - 16}{x-3} \cdot \frac{3-x}{1} \right)$

= $\frac{2x^2 - 6x + x - 3}{x-4} \cdot \left(\frac{(x+4)(x-4)}{x-3} \cdot -\frac{(x-3)}{1} \right)$

= $\frac{2x(x-3) + 1(x-3)}{\cancel{x-4}} \cdot \left(\frac{(x+4) \cancel{(x-4)}}{\cancel{x-3}} \cdot -\frac{\cancel{(x-3)}}{1} \right)$

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

$$\begin{aligned}
 \# 38 \quad & \frac{2M^2+4M+2}{6M-6} \times \frac{M^2-1}{5M+5} \\
 = & \frac{2M^2+2M+2M+2}{6(M-1)} \cdot \frac{(M+1)(M-1)}{5(M+1)} \\
 = & \frac{2M(M+1)+2(M+1)}{30} \\
 = & \frac{(2M+2)(M+1)}{30} = \frac{2(M+1)^2}{30} = \frac{(M+1)^2}{15}
 \end{aligned}$$

Section 6.7

$$\begin{aligned}
 \# 26 \quad & \frac{2}{x+2} - \frac{3-x}{x^2+2x} + \frac{1}{x} \\
 = & \frac{2}{x+2} + \frac{(x-3)}{x(x+2)} + \frac{1}{x} \\
 = & \frac{2x}{(x+2)x} + \frac{(x-3)}{x(x+2)} + \frac{x+2}{x(x+2)} \\
 = & \frac{2x+x-3+x+2}{x(x+2)} = \frac{4x-1}{x(x+2)}
 \end{aligned}$$

$$\begin{aligned}
 \# 28 \quad & \frac{2}{n^2+4n+4} - \frac{3}{n+2} \\
 = & \frac{2}{(n+2)^2} - \frac{3(n+2)}{(n+2)^2} = \frac{2-3(n+2)}{(n+2)^2} \\
 = & \frac{2-3n-6}{(n+2)^2} = \frac{-3n-4}{(n+2)^2}
 \end{aligned}$$

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$$\# 32 \quad \frac{N-1}{2N^3-4N^2} - \frac{5}{2-N}$$

$$= \frac{N-1}{2N^2(N-2)} - \frac{5}{-(N-2)}$$

$$= \frac{N-1}{2N^2(N-2)} + \frac{5(2N^2)}{2N^2(N-2)}$$

$$= \frac{N-1+10N^2}{2N^2(N-2)} = \frac{10N^2+N-1}{2N^2(N-2)}$$

$$\# 36 \quad \frac{5}{2x^3-3x^2+x} - \frac{x}{x^4-x^2} + \frac{2-x}{2x^2+x-1}$$

$$= \frac{5}{x(2x^2-3x+1)} - \frac{x}{x^2(x^2-1)} + \frac{-(x-2)}{(2x-1)(x+1)}$$

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

$$= \frac{5}{x(2x-1)(x-1)} - \frac{1}{x(x+1)(x-1)} - \frac{x-2}{(2x-1)(x+1)}$$

$$\begin{aligned}
&= \frac{5(x+1)}{x(2x-1)(x^2-1)} - \frac{(2x-1)}{x(2x-1)(x^2-1)} - \frac{(x-2)(x)(x-1)}{x(2x-1)(x^2-1)} \\
&= \frac{5x+5 - 2x+1 - x(x^2-3x+2)}{x(2x-1)(x^2-1)} \\
&= \frac{-x^3+3x^2-x+6}{x(2x-1)(x^2-1)}
\end{aligned}$$

#42

$$\begin{aligned}
&\frac{v^2-9}{v} \\
&\frac{\frac{1}{v} - \frac{1}{3}}{\frac{3}{3v} - \frac{v}{3v}} \\
&= \frac{(v+3)(v-3)}{v} = \frac{(v+3)(v-3)}{v} \\
&= \frac{(v+3)(v-3)}{v} \cdot \frac{3v}{(3-v)} \\
&= \frac{3(v+3)(v-3)}{-(v-3)} = -3(v+3)
\end{aligned}$$

The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that every entry should be supported by a valid receipt or invoice. This ensures transparency and allows for easy verification of the data.

In the second section, the author outlines the various methods used to collect and analyze the data. This includes both primary and secondary research techniques. The primary research involved direct observation and interviews with key stakeholders, while the secondary research focused on reviewing existing literature and reports.

The third part of the document details the findings of the study. It highlights several key trends and patterns that emerged from the data. These findings are presented in a clear and concise manner, using tables and graphs where appropriate to illustrate the results.

Finally, the document concludes with a series of recommendations based on the findings. These recommendations are designed to address the identified issues and provide practical solutions for improving the overall process. The author also notes that further research is needed to explore certain aspects of the study in more detail.

#44

$$\frac{\frac{2}{a} - \frac{1}{4} - \frac{3}{4a-4b}}{\frac{1}{4a^2-4b^2} - \frac{2}{b}} = \frac{\frac{2}{a} - \frac{1}{4} - \frac{3}{4(a-b)}}{\frac{1}{4(a^2-b^2)} - \frac{2}{b}}$$

$$= \frac{\frac{2(4)(a-b)}{4a(a-b)} - \frac{(1)(a)(a-b)}{4a(a-b)} - \frac{3a}{4a(a-b)}}{\frac{b}{4b(a^2-b^2)} - \frac{2(4)(a^2-b^2)}{4b(a^2-b^2)}}$$

$$= \frac{8(a-b) - a(a-b) - 3a}{4a(a-b)}$$

$$\frac{b - 8(a^2-b^2)}{4b(a^2-b^2)}$$

$$= \frac{8(a-b) - a(a-b) - 3a}{\cancel{4a(a-b)}} \cdot \frac{\cancel{4b(a+b)(a-b)}}{b - 8(a^2-b^2)}$$

$$= \frac{(a-b)(8-a) - 3a}{a(b - 8(a^2-b^2))}$$

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Section 6.8

$$\#16 \quad \frac{1}{2R} - \frac{1}{3} = \frac{2}{3R}$$

$$\frac{3}{6R} - \frac{2R}{6R} = \frac{4}{6R}$$

$$3 - 2R = 4$$

$$2R = -1$$

$$R = -\frac{1}{2}$$

$$\#20 \quad \frac{5}{n+2} = \frac{3}{2n}$$

$$10n = 3n + 6$$

$$7n = 6$$

$$n = 6/7$$

$$\#22 \quad \frac{3}{4x-6} + \frac{1}{4} = \frac{5}{2x-3}$$

$$\frac{3}{2(2x-3)} + \frac{1}{4} = \frac{5}{(2x-3)}$$

$$\frac{3 \cdot 2}{2(2x-3)} + \frac{(2x-3)}{4(2x-3)} = \frac{5 \cdot 4}{4(2x-3)}$$

$$6 + 2x - 3 = 20$$

$$2x = 17$$

$$x = 17/2$$

$$\# 26 \quad \frac{3}{t+3} - \frac{1}{t} = \frac{5}{2t+6}$$

$$\frac{3}{t+3} - \frac{1}{t} = \frac{5}{2(t+3)}$$

$$\frac{3(2)t}{(t+3)t(2)} - \frac{2(t+3)}{2t(t+3)} = \frac{5t}{2t(t+3)}$$

$$6t - 2(t+3) = 5t$$

$$6t - 2t - 6 = 5t$$

$$4t - 6 = 5t$$

$$t = -6$$

$$\# 30 \quad \frac{2}{x^2-1} - \frac{2}{x+1} = \frac{1}{x-1}$$

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

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

$$2 - 2x + 2 = x+1$$

$$3x = 3$$

$$x = 1$$

SECTION 7.1

#16 $x^2 - 11x + 30 = 0$

$(x-6)(x-5) = 0$

$x = 6$ or $x = 5$

#24 $4x^2 + 25 = 20x$

$4x^2 - 20x + 25 = 0$

$4x^2 - 10x - 10x + 25 = 0$

$2x(2x-5) - 5(2x-5) = 0$

$(2x-5)(2x-5) = 0$

$2x-5 = 0$

$2x = 5$

$x = 5/2$

#40 $m = 135 - 6t - t^2$

when $m = 0$ there is no fuel

$0 = -t^2 - 6t + 135$

$t^2 + 6t - 135 = 0$

$(t+15)(t-9) = 0$

~~$t = -15$~~ or $t = 9$

time is positive so the answer is 9 seconds.