Chapters 1–9 Cumulative Review

1. To verify if the given point is a solution, use the values of \( x \) and \( y \) in both equations. If the values work in both equations, then the point is a solution.
   a) Yes
   b) No

2. $238.36

3. a) \( \frac{4}{5} \)  
   b) \( \frac{3}{5} \)
   c) \( \frac{3}{5} \)  
   d) \( \frac{4}{5} \)
   e) \( \frac{2}{3} \)  
   f) \( \frac{3}{4} \)

4. a) 64 
   b) -625 
   c) 49 
   d) -\( \frac{27}{5} \) 
   e) \( \frac{3}{64} \)  
   f) \( -\frac{1}{125} \)

5. a) \(-56n^2 + 102n - 27\)
   b) \(-4s^4 - 6s^3 + 21s^2 + 13s - 15\)

6. Example: It takes Jon 5 s to reach the bottom of the first hill on his bike. For a few seconds, Jon pedals to maintain his speed on a flat section of road. He then begins to go down a second hill and continues to accelerate. At the bottom of the hill, the road rises up. Jon coasts up the third hill as his speed slows. At the top, Jon maintains his speed by pedalling until he reaches a slight decline, at which point he begins to accelerate again. He then maintains this speed by pedalling.

7. a) (6, -10)
18. a) \(x^{\frac{23}{5}}\)  
   b) \(\frac{1}{64}\)  
   c) \(z^4\)  
   d) \(\frac{1}{5p^2}\)  
   e) \(x^{200}y^{125}\)  
   f) \(\frac{9x^2(0.16)^2}{y^2}\)

d) This situation depicts a function because for every value in the domain there is a unique value in the range.

19. a) \((4x - 1)(x + 2)\)  
   b) \((x - 3)(x - 6)\)  
   c) \(-3(2m - 3n)(4m - n)\)  
   d) \((7x + 2y)(5x - 3y)\)  
   e) \(12t(s + 6)(s - 4)\)

20. a) \((4, -2)\)  
   b) \((-1, 8)\)

21. 176 miles; 50 km; 66 ft; 213 m

22. a) 0.67 ft  
   b) 5.85 cm  
   c) 4.33 m  
   d) 9.40 cm

23. a) \(\frac{4}{9}, 0.777..., \sqrt{634}, \sqrt{82}\); The last two numbers are irrational.
   b) \(\sqrt{67}, \sqrt{1296}, 14\frac{1}{3}, \sqrt{289}; \sqrt{67}\) is irrational.

24. \([-18.4, 69.8]\)

25. a) slope-intercept form: \(y = 3x + 5\); general form: \(3x - y + 5 = 0\)
   b) slope-intercept form: \(y = \frac{3}{2}x - \frac{45}{4}\); general form: \(3x - 4y - 45 = 0\)

26. a) \((c - 13)(c + 13)\)
   b) \((9 + 4y^2)(3 - 2y)(3 + 2y)\)
   c) \(7(5h - 12)^2(5h + 5f)\)
   d) \((x - 4)(x + 4)(x - 5)(x + 5)\)

27. a) Example: domain: \(\{x | 0 \leq x \leq 30, x \in \mathbb{N}\}\); range: \(\{y | y \geq 40, y \in \mathbb{N}\}\)

b) If there were 9 pledges, there would be a total of $220 in funds.

c) 24 pledges

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Green button. Answers.
Chapter 7

Each question is written response. Show all of your work.

Problem 1: [Equation and calculations]

Problem 2: [Equation and calculations]

Problem 3: [Equation and calculations]

Problem 4: [Equation and calculations]
The Total Cost of 35 is $1750.

\[ y = 1750 + 35 \]

Use the equation in (c) to find the total cost of 77 items of work.

\[ y = 55x + 35 \]

For: \( x = 55 \) and 35

- Find the correct amount of \( y \) for the point (3,9).
- Divide 3 by 9 to find the slope.
- Use the point-slope form of the equation.

The line is the equation of the line below in standard form (2x + 3y = 10).

\[ \frac{1}{x} + \frac{3}{y} = \frac{2}{10} \]

By the equation for a line, in standard form with the same slope as the line is:

\[ (0, 0), (x, x + 10), (0, 0), (x, 0) \]

The slope is correct for a line, in standard form with the same slope as the line is:

\[ x + y = 13 \]

Each question is written response. Show all of your work.
Chapter 5

Each question is written response. Show all of your work.

Notes/Steps
5. Graph the line that passes through \((2, 4)\) and has the slope \(m = -2\). Find the point \(P\) that makes the point slope form of the line equation.

\[ y - y_1 = m(x - x_1) \]

\[ y - 4 = -2(x - 2) \]

6. Determine the slope of the following line (x-axis): \(\frac{3}{2}\). The slope of a line is the change in y divided by the change in x. In this case, the line is horizontal, so the slope is 0.

7. Graph the line that passes through \((1, 3)\) and \((4, 7)\) using the point-slope form of the line equation:

\[ y - y_1 = m(x - x_1) \]

\[ y - 3 = \frac{7 - 3}{4 - 1}(x - 1) \]

8. Complete the following table of the functions, showing all steps:

<table>
<thead>
<tr>
<th>x</th>
<th>y</th>
<th>f(x)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>

9. For the following functions, determine if y is a function of x:

\[ f(x) = \sqrt{x} \]

10. Graph the function \(y = x^2\) and determine the domain and range of the function (range): [0, ∞)

11. Chapter 4

   Each question is written response. Show all of your work.

   Notes/Steps: Show all of your work.
Factoring Special Cases

Factor each completely.

1) \(16n^2 - 9\)
   \((4n + 3)(4n - 3)\)

2) \(4m^2 - 25\)
   \((2m + 5)(2m - 5)\)

3) \(16b^2 - 40b + 25\)
   \((4b - 5)^2\)

4) \(4x^2 - 4x + 1\)
   \((2x - 1)^2\)

5) \(9x^2 - 1\)
   \((3x + 1)(3x - 1)\)

6) \(n^2 - 25\)
   \((n + 5)(n - 5)\)

7) \(n^4 - 100\)
   \((n^2 + 10)(n^2 - 10)\)

8) \(a^4 - 9\)
   \((a^2 + 3)(a^2 - 3)\)

9) \(k^4 - 36\)
   \((k^2 + 6)(k^2 - 6)\)

10) \(n^4 - 49\)
    \((n^2 + 7)(n^2 - 7)\)
11) \(98n^2 - 200\) 
\[2(7n + 10)(7n - 10)\]

12) \(3 + 6b + 3b^2\) 
\[3(1 + b)^2\]

13) \(400 - 36v^2\) 
\[4(10 + 3v)(10 - 3v)\]

14) \(100x^2 + 180x + 81\) 
\[(10x + 9)^2\]

15) \(10n^2 + 100n + 250\) 
\[10(n + 5)^2\]

16) \(49n^2 - 56n + 16\) 
\[(7n - 4)^2\]

17) \(49x^2 - 100\) 
\[(7x + 10)(7x - 10)\]

18) \(1 - r^2\) 
\[(1 + r)(1 - r)\]

19) \(10p^3 - 1960p\) 
\[10p(p + 14)(p - 14)\]

20) \(343b^2 - 7b^4\) 
\[7b^2(7 + b)(7 - b)\]

21) \(81v^4 - 900v^2\) 
\[9v^2(3v + 10)(3v - 10)\]

22) \(200m^4 + 80m^3 + 8m^2\) 
\[8m^2(5m + 1)^2\]
Factor each completely.

1) $b^2 + 8b + 7$
   $(b + 7)(b + 1)$

2) $a^2 - 11a + 10$
   $(a - 10)(a - 1)$

3) $m^2 + m - 90$
   $(m - 9)(m + 10)$

4) $n^2 + 4n - 12$
   $(n - 2)(n + 6)$

5) $n^2 - 10n + 9$
   $(n - 1)(n - 9)$

6) $b^2 + 16b + 64$
   $(b + 8)^2$

7) $m^2 + 2m - 24$
   $(m + 6)(m - 4)$

8) $x^2 - 4x + 24$
   Not factorable

9) $k^2 - 13k + 49$
   $(k - 7)(k - 7)$

10) $a^2 + 11a + 18$
    $(a + 2)(a + 9)$

11) $a^2 - 8a - 24$
    $(a + 7)(a - 3)$

12) $m^5 - 8m + 6$
    $(m - 2)(m - 3)$
13) $b^2 - 6b + 8$
   $(b - 4)(b - 2)$

14) $n^2 + 6n + 8$
   $(n + 2)(n + 4)$

15) $2n^2 + 6n - 108$
   $2(n + 9)(n - 6)$

16) $5n^2 + 10n + 20$
   $5(n^2 + 2n + 4)$

17) $2x^2 + 22x + 60$
   $2(x + 5)(x + 6)$

18) $a^2 - a - 90$
   $(a - 10)(a + 9)$

19) $p^2 + 11p + 10$
   $(p + 10)(p + 1)$

20) $5y^2 - 30y + 40$
   $5(y - 2)(y - 4)$

21) $2p^2 + 2p - 4$
   $2(p - 1)(p + 2)$

22) $4y^2 - 4y - 8$
   $4(y + 1)(y - 2)$

23) $x^2 - 15x + 50$
   $(x - 10)(x - 5)$

24) $y^2 - 7y + 10$
   $(y - 5)(y - 2)$

25) $p^2 + 3p - 18$
   $(p - 3)(p + 6)$

26) $6x^2 + 66x + 60$
   $6(x + 10)(x + 1)$