

TEST A Pages 17-18

I.

1. $51 - y$

2. $n + 2; n - 1$

3. $3y; y - 6; 3y + 5;$
 $(y + 8) + (3y + 8) = 4y + 16$

4. $26 + s; g - 26$

II. The check is left for the teacher.

1. $3x = 15$
 $\frac{3x}{3} = \frac{15}{3}$
 $x = 5$

2. $\frac{1}{2}x = 30$
 $2(\frac{1}{2}x) = 2(30)$
 $x = 60$

3. $\frac{2}{3}x = 12$
 $\frac{3}{2}(\frac{2}{3}x) = \frac{3}{2}(12)$
 $x = 18$

4. $6 + y = 19$
 $6 + y - 6 = 19 - 6$
 $y = 13$

5. $z - 7 = 12$
 $z - 7 + 7 = 12 + 7$
 $z = 19$

6. $6a + 2 = 20$
 $6a + 2 - 2 = 20 - 2$
 $6a = 18$
 $\frac{6a}{6} = \frac{18}{6}$
 $a = 3$

7. $3y - 5 = 7$
 $3y - 5 + 5 = 7 + 5$
 $3y = 12$
 $\frac{3y}{3} = \frac{12}{3}$
 $y = 4$

8. $11x - 8x - 8 = 10$
 $3x - 8 = 10$
 $3x - 8 + 8 = 10 + 8$
 $3x = 18$
 $\frac{3x}{3} = \frac{18}{3}$
 $x = 6$

III.

1. let x = length of shorter room
 $x + 6$ = length of longer room
length of room = length of room
 $(x) + (x + 6) = 38$

2. let $4x$ = original price
 x = amount of reduction
selling price = selling price
 $4x - x = 48$

3. let x = number sold by Carol
 $4x$ = number sold by Tom
total magazines = total magazines sold
 $(x) + (4x) = 35$

4. let x = length of one side
 $x + 3$ = length of second side
 $2x$ = length of third side
perimeter of triangle = perimeter of triangle
 $(x) + (x + 3) + (2x) = 27$

TEST B Pages 18

I.

1. $30 - x$

2. $e - 2; e + 1$

3. $g - 14; s + 14$

4. $2m; m - 7; 2m + 11;$
 $(m + 5) + (2m + 5) = 3m + 10$

Key to Unit 1, pages 17-19

II. The check is left for the teacher.

$$\begin{aligned} 1. \quad 5x &= 30 \\ \frac{5x}{5} &= \frac{30}{5} \\ x &= 6 \end{aligned}$$

$$\begin{aligned} 2. \quad \frac{1}{3}x &= 8 \\ 3(\frac{1}{3}x) &= 3(8) \\ x &= 24 \end{aligned}$$

$$\begin{aligned} 3. \quad \frac{3}{4}y &= 12 \\ \frac{4}{3}(\frac{3}{4}y) &= \frac{4}{3}(12) \\ y &= 16 \end{aligned}$$

$$\begin{aligned} 4. \quad a + 11 &= 17 \\ a + 11 - 11 &= 17 - 11 \\ a &= 6 \end{aligned}$$

$$\begin{aligned} 5. \quad b - 8 &= 4 \\ b - 8 + 8 &= 4 + 8 \\ b &= 12 \end{aligned}$$

$$\begin{aligned} 6. \quad 8z + 5 &= 29 \\ 8z + 5 - 5 &= 29 - 5 \\ 8z &= 24 \\ \frac{8z}{8} &= \frac{24}{8} \\ z &= 3 \end{aligned}$$

$$\begin{aligned} 7. \quad 5x - 2 &= 8 \\ 5x - 2 + 2 &= 8 + 2 \\ 5x &= 10 \\ \frac{5x}{5} &= \frac{10}{5} \\ x &= 2 \end{aligned}$$

$$\begin{aligned} 8. \quad 9x - 5x - 11 &= 17 \\ 4x - 11 &= 17 \\ 4x - 11 + 11 &= 17 + 11 \\ 4x &= 28 \\ \frac{4x}{4} &= \frac{28}{4} \\ x &= 7 \end{aligned}$$

III.

$$\begin{aligned} 1. \quad \text{let } x &= \text{number of peanut butter} \\ x - 18 &= \text{number of oatmeal} \\ \text{total cookies} &= \text{total cookies} \\ \text{baked} &= \text{baked} \\ (x) + (x - 18) &= 112 \end{aligned}$$

$$\begin{aligned} 2. \quad \text{let } x &= \text{earnings of younger} \\ 3x &= \text{earnings of older} \\ \text{total earned} &= \text{total earned} \\ (x) + (3x) &= 75 \end{aligned}$$

$$\begin{aligned} 3. \quad \text{let } x &= \text{Greg's age} \\ 6x &= \text{Father's age} \\ \text{sum of ages} &= \text{sum of ages} \\ (x) + (6x) &= 42 \end{aligned}$$

$$\begin{aligned} 4. \quad \text{let } w &= \text{width of rectangle} \\ 4w &= \text{length of rectangle} \\ \text{perimeter} &= \text{perimeter} \\ 2w + 2(4w) &= 65 \end{aligned}$$

TEST C Page 19

$$\begin{aligned} 1. \quad 1. \quad \text{let } x &= \text{number of bus drivers, } 3 \\ 2. \quad 5x &= \text{number of parents, } 15 \\ 15x &= \text{number of boys, } 45 \\ 15x - 12 &= \text{number of girls, } 33 \\ &\qquad\qquad\qquad \text{total riders} = \text{total riders} \end{aligned}$$

$$\begin{aligned} 3. \quad (x) + (5x) + (15x) + (15x - 12) &= 96 \\ 36x - 12 &= 96 \\ 36x - 12 + 12 &= 96 + 12 \\ 36x &= 108 \\ \frac{36x}{36} &= \frac{108}{36} \\ x &= 3 \end{aligned}$$

$$\begin{array}{r} 5. \quad 3 \\ 15 \\ 45 \\ +33 \\ \hline 96 \checkmark \end{array}$$

Key to Unit 2, pages 32-33

Time Tests Pages 32-33

(A)

1.
$$\begin{aligned} 2x^2 - 3xy \\ = 2 \cdot 3^2 - 3 \cdot 3 \cdot 2 \\ = 2 \cdot 9 - 3 \cdot 3 \cdot 2 \\ = 18 - 9 \cdot 2 \\ = 18 - 18 \\ = 0 \end{aligned}$$

2.
$$\begin{aligned} 3mn + nm^2 \\ = 3 \cdot 4 \cdot 3 + 3 \cdot 4^2 \\ = 3 \cdot 4 \cdot 3 + 3 \cdot 16 \\ = 36 + 48 \\ = 84 \end{aligned}$$

3.
$$\begin{aligned} ab^2 - 2ab \\ = 3 \cdot 2^2 - 2 \cdot 3 \cdot 2 \\ = 3 \cdot 4 - 2 \cdot 3 \cdot 2 \\ = 12 - 6 \cdot 2 \\ = 12 - 12 \\ = 0 \end{aligned}$$

4.
$$\begin{aligned} \frac{x^2}{2} + \frac{4xy}{5} \\ = \frac{2^2}{2} + \frac{4 \cdot 2 \cdot 5}{5} \\ = \frac{4}{2} + \frac{40}{5} \\ = 2 + 8 \\ = 10 \end{aligned}$$

5.
$$\begin{aligned} a^2 + 3a^2b \\ = 2^2 + 3 \cdot 2^2 \cdot 4 \\ = 4 + 3 \cdot 4 \cdot 4 \\ = 4 + 48 \\ = 52 \end{aligned}$$

6.
$$\begin{aligned} 5a^2 - 2ac \\ = 5 \cdot 2^2 - 2 \cdot 2 \cdot 3 \\ = 5 \cdot 4 - 2 \cdot 2 \cdot 3 \\ = 20 - 12 \\ = 8 \end{aligned}$$

7.
$$\begin{aligned} 3ab + a^2b \\ = 3 \cdot 2 \cdot 3 + 2^2 \cdot 3 \\ = 3 \cdot 2 \cdot 3 + 4 \cdot 3 \\ = 18 + 12 \\ = 30 \end{aligned}$$

8.
$$\begin{aligned} 5x^2 - y^2 \\ = 5 \cdot 3^2 - 5^2 \\ = 5 \cdot 9 - 25 \\ = 45 - 25 \\ = 20 \end{aligned}$$

9.
$$\begin{aligned} \frac{a^2}{3} + \frac{4ay}{6} \\ = \frac{3^2}{3} + \frac{4 \cdot 3 \cdot 4}{6} \\ = \frac{9}{3} + \frac{48}{6} \\ = 3 + 8 \\ = 11 \end{aligned}$$

10.
$$\begin{aligned} r^2 + s^2 \\ = 5^2 + 3^2 \\ = 25 + 9 \\ = 34 \end{aligned}$$

11.
$$\begin{aligned} 4x^2 - 2xy \\ = 4 \cdot 2^2 - 2 \cdot 2 \cdot 3 \\ = 4 \cdot 4 - 2 \cdot 2 \cdot 3 \\ = 16 - 12 \\ = 4 \end{aligned}$$

12.
$$\begin{aligned} ab^2 + 2ab \\ = 4 \cdot 3^2 + 2 \cdot 4 \cdot 3 \\ = 4 \cdot 9 + 2 \cdot 4 \cdot 3 \\ = 36 + 24 \\ = 60 \end{aligned}$$

13.
$$\begin{aligned} cd^2 - 3cd \\ = 3 \cdot 4^2 - 3 \cdot 3 \cdot 4 \\ = 3 \cdot 16 - 3 \cdot 3 \cdot 4 \\ = 48 - 36 \\ = 12 \end{aligned}$$

14.
$$\begin{aligned} (x + y)^2 \\ = (5 + 3)^2 \\ = 8^2 \\ = 64 \end{aligned}$$

15.
$$\begin{aligned} 3rs - 2s^2 \\ = 3 \cdot 4 \cdot 5 - 2 \cdot 5^2 \\ = 3 \cdot 4 \cdot 5 - 2 \cdot 25 \\ = 60 - 50 \\ = 10 \end{aligned}$$

(B)

1. $7a^2 + 7$

2. $4x + y$

3. $2x^3 + 6y$

4. $5x^2 + 2$

5. $3xy + 21$

6. $11a^2 + 9b$

7. $11x^2 + 20x$

8. $2x + 3$

9. $17b^2 + 7$

10. $19ab + 8c$

11. $6a + 6b^3$

12. $18r + 19$

13. $9a^3 + 1$

14. $5a$

Test A Page 34

I 1. $3pq$ 2. $xy - m^2$ 3. $(x - y)(3y + 4)$ 4. $\frac{3x}{y^2}$ 5. $a + 2b$

II 1. $5x^3$ 2. m^4s^2 3. $6a^2b^3$

III Answers will vary.

IV 1. $\frac{3xy - 2mn}{4y} = \frac{3 \cdot 3 \cdot 2 - 2 \cdot 4 \cdot 1}{4 \cdot 2} = \frac{18 - 8}{4} = 10$ 2. $\frac{m^2}{4y} + \frac{ax}{7m} = \frac{4^2}{4 \cdot 2} + \frac{0.3}{7 \cdot 4} = \frac{16}{8} + 0 = 2$ 3. $\frac{xy^3}{3 \cdot 2^3} = \frac{3 \cdot 8}{24} = 1$ 4. $\frac{x^3 + y^2}{3^3 + 2^2} = \frac{27 + 4}{31}$

5. $m + xy - m \div y = 4 + 3 \cdot 2 - 4 \div 2 = 4 + 6 - 2 = 8$ 6. $\frac{(y + m)^2}{(2 + 4)^2} = \frac{6^2}{36} = 1$ 7. $(m - n)(x + y) = (4 - 1)(3 + 2) = 3 \cdot 5 = 15$

V 1. $3a^2 + 2a + 1$ 2. $6x + 4y + 8z$ 3. $6ab + 9$ 4. 0

TEST B Pages 34-35

I 1. $b^3 + c^2$ 2. $5a \cdot 2c$ or $10ac$ 3. $(3a - 7)(2a + 5)$ 4. $\frac{b^2}{xy}$ 5. $p - 2q$

II 1. $3a^3$ 2. b^2d^4 3. $4a^3bc^2$

III 1.-3. Answers will vary. 4. binomial

IV 1. 7×5 2. $\frac{8 - 3 \times 2 + 24 \div 2}{8 - 6 + 12} = \frac{8 - 6 + 12}{14} = 14$

V 1. $3ab + 5cd = 3 \cdot 0 \cdot 1 + 5 \cdot 2 \cdot 3 = 0 + 30 = 30$ 2. $\frac{d^3}{b + c} = \frac{3^3}{1 + 2} = \frac{27}{3} = 9$ 3. $\frac{d^2 - c^2}{3^2 - 2^2} = \frac{9 - 4}{5} = 1$

Test A Page 34

I 1. $3pq$ 2. $xy - m^2$ 3. $(x - y)(3y + 4)$ 4. $\frac{3x}{y^2}$ 5. $a + 2b$

II 1. $5x^3$ 2. m^4s^2 3. $6a^2b^3$

III Answers will vary.

IV 1. $\frac{3xy - 2mn}{4y} + \frac{ax}{7m}$ 2. $\frac{4^2}{4 \cdot 2} + \frac{0.3}{7 \cdot 4}$ 3. $\frac{xy^3}{3 \cdot 2^3}$ 4. $\frac{x^3 + y^2}{3^3 + 2^2}$
 $= 3 \cdot 3 \cdot 2 - 2 \cdot 4 \cdot 1$
 $= 18 - 8$
 $= 10$
 $= \frac{16}{8} + 0$
 $= 2$
 $= 27 + 4$
 $= 31$

5. $m + xy - m \div y$ 6. $\frac{(y + m)^2}{(2 + 4)^2}$ 7. $\frac{(m - n)(x + y)}{(4 - 1)(3 + 2)}$
 $= 4 + 3 \cdot 2 - 4 \div 2$
 $= 4 + 6 - 2$
 $= 8$
 $= 6^2$
 $= 36$
 $= 3 \cdot 5$
 $= 15$

V 1. $3a^2 + 2a + 1$ 2. $6x + 4y + 8z$ 3. $6ab + 9$ 4. 0

TEST B Pages 34-35

I 1. $b^3 + c^2$ 2. $5a \cdot 2c$ or $10ac$ 3. $(3a - 7)(2a + 5)$ 4. $\frac{b^2}{xy}$ 5. $p - 2q$

II 1. $3a^3$ 2. b^2d^4 3. $4a^3bc^2$

III 1.-3. Answers will vary. 4. binomial

IV 1. 7×5 2. $\frac{8 - 3 \times 2 + 24 \div 2}{8 - 6 + 12}$
 $= 14$

V 1. $3ab + 5cd$ 2. $\frac{d^3}{b + c}$ 3. $\frac{d^2 - c^2}{3^2 - 2^2}$
 $= 3 \cdot 0 \cdot 1 + 5 \cdot 2 \cdot 3$
 $= 0 + 30$
 $= 30$
 $= \frac{3^3}{1 + 2}$
 $= \frac{27}{3}$
 $= 9$
 $= 9 - 4$
 $= 5$