

Page 165 • CUMULATIVE REVIEW (Ch. 1-3)

1. $-1(4 - 7)^2 + 6 = -1(-3)^2 + 6 = -1(9) + 6 = -9 + 6 = -3$

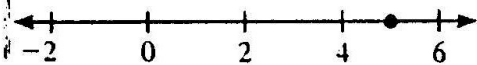
2. $2 - |(-3)(4) + (-1)^2| = 2 - |-12 + 1| = 2 - |-11| = 2 - 11 = -9$

3. $2(x + y) - 3(y - x) = 2x + 2y - 3y + 3x = 5x - y$

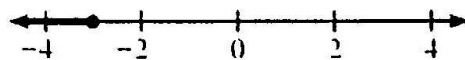
4. $\frac{|a| + |b|}{|a + b|} = \frac{|-6| + |2|}{|-6 + 2|} = \frac{6 + 2}{|-4|} = \frac{8}{4} = 2$

5. Let x = time, in hours, driving 55 mi/h; $5 - x$ = time, in hours, driving 30 mi/h;
 $30(5 - x) + 55x = 250$; $150 - 30x + 55x = 250$; $25x = 100$; $x = 4$; he spent 4 h at
 55 mi/h

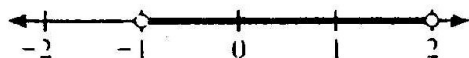
6. $3(2x - 1) = 4x + 7$; $6x - 3 = 4x + 7$; $2x = 10$; $x = 5$; $\{5\}$



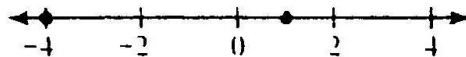
7. $13 - 7y \geq 34$; $-7y \geq 21$; $y \leq -3$; $\{y : y \leq -3\}$



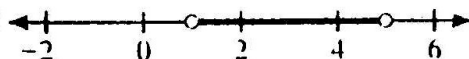
8. $5 < 3w + 8 < 14$; $-3 < 3w < 6$; $-1 < w < 2$; $\{w : -1 < w < 2\}$



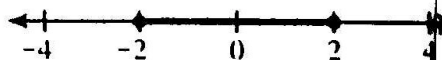
9. $|2m + 3| = 5$; $2m + 3 = 5$ or $2m + 3 = -5$; $2m = 2$ or $2m = -8$; $m = 1$ or $m = -4$;
 $\{-4, 1\}$



10. $\left| \frac{c - 3}{2} \right| < 1$; $|c - 3| < 2$; $-2 < c - 3 < 2$; $1 < c < 5$; $\{c : 1 < c < 5\}$



11. $6 - |n| \geq 4$; $2 \geq |n|$; $-2 \leq n \leq 2$; $\{n : -2 \leq n \leq 2\}$



12. (1) $a + (b - a) = a + (b + (-a))$ (Def. of subtr.);

(2) $a + (b - a) = a + ((-a) + b)$ (Comm. prop. of add.);

(3) $a + (b - a) = (a + (-a)) + b$ (Assoc. prop. of add.);

(4) $a + (b - a) = 0 + b$ (Prop. of opposites);

(5) $a + (b - a) = b$ (Ident. prop. of add.)

13. $3x - 2y = 1$; $y = \frac{3x - 1}{2}$; $y = \frac{3(-1) - 1}{2} = -2$; $y = \frac{3(0) - 1}{2} = -\frac{1}{2}$; $y = \frac{3(1) - 1}{2} = 1$;

$\left\{ (-1, -2), \left(0, -\frac{1}{2}\right), (1, 1) \right\}$

14. $m = -\frac{A}{B} = -\frac{8}{-6} = \frac{4}{3}$ 15. $3y - 9 = 0$; $3y = 9$; $y = 3$; $m = 0$

16. $y - (-3) = -\frac{1}{2}(x - 4)$; $2y + 6 = -x + 4$; $x + 2y = -2$

ALGEBRA II

FINAL EXAM REVIEW

SEMESTER I

(Chapters 1 - 7)

**** Calculators will NOT be used on the final exam ****

• answers to :

cum. review (ch. 1-3) p. 165

cum. review (ch. 4-7) pp. 348-349

17. $m = \frac{\frac{1}{2} - 4}{-3 - (-2)} = \frac{-\frac{7}{2}}{-1} = \frac{7}{2}; y - 4 = \frac{7}{2}(x - (-2)); 2y - 8 = 7x + 14; 7x - 2y = -22$

18. $b = 4; y = mx + 4; 0 = m(6) + 4; m = -\frac{2}{3}; y = -\frac{2}{3}x + 4; 3y = -2x + 12;$
 $2x + 3y = 12$

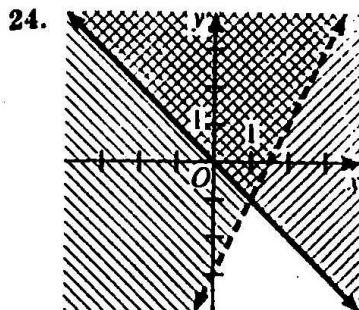
19. $m = -\frac{A}{B} = -\frac{5}{-4} = \frac{5}{4}; y - (-2) = \frac{5}{4}(x - (-1)); 4y + 8 = 5x + 5; 5x - 4y = 3$

20. The slope of the line $2x + y = 5$ is $-2; m = \frac{1}{2}; y - 2 = \frac{1}{2}(x - 3); 2y - 4 = x - 3;$
 $x - 2y = -1$

21. $3x - 4y = 10; 6x - 8y = 20; -17y = 17; y = -1; 3x - 4(-1) = 10; 3x = 6; x = 2;$
 $2x + 3y = 1; 6x + 9y = 3; (2, -1)$

22. $y = \frac{1}{2}x - 1$
 $x - 2y = 4; x - 2\left(\frac{1}{2}x - 1\right) = 4; x - x + 2 = 4; 2 = 4; \text{no solution}$

23. $x = 7y - 4; y = 7(7y - 4) + 4; y = 49y - 28 + 4; 48y = 24; y = \frac{1}{2}; x = 7\left(\frac{1}{2}\right) - 4;$
 $x = -\frac{1}{2}; \left(-\frac{1}{2}, \frac{1}{2}\right)$



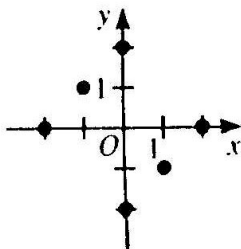
Jan. 20, 2000

25. Let a = cost, in dollars, of an adult ticket, c = cost, in dollars, of a child's ticket;
 $2a + c = 20$;
 $a + 2c = 16$; $c = 20 - 2a$; $a + 2(20 - 2a) = 16$; $a + 40 - 4a = 16$; $-3a = -24$; $a = 8$;
 an adult's ticket costs \$8

26. $f(g(2)) = f(|2(2) - 7|) = f(|-3|) = f(3) = 4 - (3)^2 = 4 - 9 = -5$;
 $g(f(2)) = g(4 - (2)^2) = g(4 - 4) = g(0) = |2(0) - 7| = |-7| = 7$

27. $m = \frac{-4 - 2}{1 - (-3)} = \frac{-6}{4} = -\frac{3}{2}$; $h(x) = -\frac{3}{2}x + b$; $h(1) = -\frac{3}{2}(1) + b = -4$; $b = -\frac{5}{2}$;
 $h(x) = -\frac{3}{2}x - \frac{5}{2}$; $h(7) = -\frac{3}{2}(7) - \frac{5}{2} = -\frac{26}{2} = -13$

28.



not a function

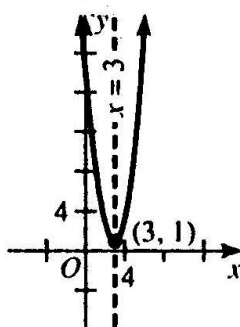
Pages 348-349 • CUMULATIVE REVIEW

(Ch. 4-7)

1. $6x^2 - 8x + 2 - 5x^2 - x + 6 = x^2 - 9x + 8$
2. $-12a^5b^3$
3. $x^8y^4z^{12}$
4. $8y^2 + 20y - 6y - 15 = 8y^2 + 14y - 15$
5. $(2x - 3)(x - 4)$
6. $x(3x - 2) + 2y(3x - 2) = (x + 2y)(3x - 2)$
7. $(4a - 3b)(4a + 3b)$
8. $3y^2(y^2 - 2y - 3) = 3y^2(y - 3)(y + 1)$
9. $(x - 4)(x + 1) = 0$; $x = 4$ or $x = -1$; $\{-1, 4\}$
10. $x^2 - 10x + 25 = 0$; $(x - 5)^2 = 0$; $x = 5$; $\{5\}$
11. $x^3 = 9x$; $x^3 - 9x = 0$; $x(x^2 - 9) = 0$; $x(x - 3)(x + 3) = 0$; $x = 0$, $x = 3$ or $x = -3$; $\{-3, 0, 3\}$
12. $y^2 + y < 20$; $y^2 + y - 20 < 0$; $(y + 5)(y - 4) < 0$; $\{y: -5 < y < 4\}$
13. Let the integers be n and $n + 2$; $n(n + 2) = 99$; $n^2 + 2n - 99 = 0$;
 $(n - 9)(n + 11) = 0$; $n = 9$ or $n = -11$; the numbers are 9 and 11 or -11 and -9
14. Let x = the length, in cm, of the hypotenuse; $(x - 8)^2 + (x - 1)^2 = x^2$;
 $x^2 - 16x + 64 + x^2 - 2x + 1 = x^2$; $x^2 - 18x + 65 = 0$; $(x - 13)(x - 5) = 0$;
 $x = 5$ (reject since $x > 8$) or $x = 13$; 13 cm
15. $\frac{12x^3y}{16x^2y^4} = \frac{3x}{4y^3}$
16. $(x^{-3}y^2)(x^{-4}y^2) = x^{-7}y^4 = \frac{y^4}{x^7}$
17. $\frac{a(a - 1)}{(a + 2)(a - 1)} = \frac{a}{a + 2}$
18. $\frac{18x^2}{(x - 4)(x + 2)} \cdot \frac{(x - 3)(x + 2)}{12x} \cdot \frac{x - 4}{3(x - 3)} = \frac{x}{2}$
19. $\frac{1}{2(y + 2)} + \frac{1}{y(y + 2)} = \frac{y + 2}{2y(y + 2)} = \frac{1}{2y}$
20. $\frac{1 - \frac{1}{m^2}}{\frac{1}{m} - 1} = \frac{\frac{m^2 - 1}{m^2}}{\frac{m - m^2}{m}} = \frac{(m - 1)(m + 1)}{-m(m - 1)} = \frac{m + 1}{-m} = -\frac{m + 1}{m}$

21. $\frac{x}{x+2} - \frac{1}{x+1} = \frac{2}{(x+2)(x+1)}$; $x(x+1) - (x+2) = 2$; $x^2 + x - x - 2 = 2$;
 $x^2 = 4$; $x = -2$ (reject) or $x = 2$; $\{2\}$
22. $y + \sqrt{y-1} = 7$; $\sqrt{y-1} = 7-y$; $y-1 = 49 - 14y + y^2$; $y^2 - 15y + 50 = 0$;
 $(y-5)(y-10) = 0$; $y = 5$ or $y = 10$ (reject); $\{5\}$
23. Let x = dollars invested at 5%; $0.05x + 0.08(4000 - x) = 284$; $-0.03x + 320 = 284$;
 $-0.03x = -36$; $x = 1200$; he invested \$1200 at 5% and \$2800 at 8%
24. $4\sqrt{5}$ 25. $2\sqrt{6} - \frac{\sqrt{6}}{2} = \frac{3\sqrt{6}}{2}$ 26. $21 + 28\sqrt{5} - 3\sqrt{5} - 20 = 1 + 25\sqrt{5}$
27. $\frac{2}{\sqrt{7}-\sqrt{3}} \cdot \frac{\sqrt{7}+\sqrt{3}}{\sqrt{7}+\sqrt{3}} = \frac{2(\sqrt{7}+\sqrt{3})}{7-3} = \frac{\sqrt{7}+\sqrt{3}}{2}$
28. $(2i\sqrt{2})(i\sqrt{6}) = -2\sqrt{12} = -4\sqrt{3}$
29. $\frac{3-2i}{3+2i} \cdot \frac{3-2i}{3-2i} = \frac{9-12i-4}{9+4} = \frac{5-12i}{13} = \frac{5}{13} - \frac{12}{13}i$
30. Let $N = 0.1\overline{54}$; then $100N = 15.4\overline{54}$ and $99N = 15.3$; $N = \frac{15.3}{99} = \frac{17}{110}$
31. $4x^2 - 12x + 7 = 0$; $4(x^2 - 3x) = -7$; $4\left(x^2 - 3x + \frac{9}{4}\right) = -7 + 9$; $4\left(x - \frac{3}{2}\right)^2 = 2$;
 $\left(x - \frac{3}{2}\right)^2 = \frac{1}{2}$; $x - \frac{3}{2} = \pm \frac{\sqrt{2}}{2}$; $x = \frac{3}{2} \pm \frac{\sqrt{2}}{2}$; $\left\{\frac{3 \pm \sqrt{2}}{2}\right\}$
32. $9y^2 + 12y + 5 = 0$; $y = \frac{-12 \pm \sqrt{144 - 180}}{18} = \frac{-12 \pm 6i}{18} = \frac{-2 \pm i}{3}$; $\left\{-\frac{2}{3} \pm \frac{1}{3}i\right\}$
33. $D = 36 - 12k$; $36 - 12k < 0$; $36 < 12k$; $k > 3$
34. $(4x - 3)^2 - 6(4x - 3) + 5 = 0$; let $z = 4x - 3$; $z^2 - 6z + 5 = 0$;
 $(z - 5)(z - 1) = 0$; $z = 5$ or $z = 1$; $x = \frac{z+3}{4}$; $x = 2$ or $x = 1$; $\{1, 2\}$

35.



36. $D = \{\text{real numbers}\}$; $-\frac{b}{2a} = \frac{8}{2} = 4$; $f(4) = 16 - 32 + 9 = -7$; since $a > 0$, -7 is the minimum; $R = \{y: y \geq -7\}$; $0 = x^2 - 8x + 9$; $x = \frac{8 \pm \sqrt{64 - 36}}{2} = 4 \pm \sqrt{7}$; zeros are $4 + \sqrt{7}$ and $4 - \sqrt{7}$
37. Let the numbers be x and $(x + 6)$, and let their product be $p(x) = x(x + 6) = x^2 + 6x$; minimum value of p occurs when $x = -\frac{6}{2} = -3$; $p(-3) = -3(3) = -9$; since $a > 0$, -9 is the minimum product