

SKILLS PRACTICE 14

For use with Lessons 5-6 through 5-8

NAME _____

DATE _____

ALGEBRA 2 REVIEW PACKET

5-6

Factor completely.

- | | |
|------------------------------------|------------------------------------|
| 1. $a^2 - 3ab - 130b^2$ _____ | 2. $ab + 20a^2b - 12b$ _____ |
| 3. $m^6 + 9m^3 - 10$ _____ | 4. $x^4 - 13x^2 + 36$ _____ |
| 5. $9x^3y - 25xy^3$ _____ | 6. $2x^5 + 16x^2y^3$ _____ |
| 7. $xt^6 - 64x$ _____ | 8. $y^2x^4 - 16y^6$ _____ |
| 9. $xy + yz - xw - wz$ _____ | 10. $x^2 + 4x + 4 - y^2$ _____ |
| 11. $8y^3 + 24y^2 - 7y - 21$ _____ | 12. $x^2 + 12x + 36 - 25y^2$ _____ |
| 13. $6a^2b^2 + 29ab + 28$ _____ | 14. $36c^2 - 80cd + 16d^2$ _____ |
| 15. $6x^2 - 33x + 45$ _____ | 16. $12c^2 - 11c - 15$ _____ |
| 17. $12d^2 - 41d - 15$ _____ | 18. $32c^3 - 108d^3$ _____ |

5-7

Solve

- | | |
|----------------------------------|----------------------------------|
| 19. $12x^2 + 11x - 15 = 0$ _____ | 20. $12x^2 - 36x + 15 = 0$ _____ |
| 21. $12y^2 - 8y - 15 = 0$ _____ | 22. $2x^2 - 11x + 15 = 0$ _____ |
| 23. $s^2 + 10s = 0$ _____ | 24. $z^2 = 121$ _____ |
| 25. $w^2 - 169 = 0$ _____ | 26. $9x^2 - 3x = 20$ _____ |
| 27. $20 - 36x + 9x^2 = 0$ _____ | 28. $20 + 57x - 9x^2 = 0$ _____ |
| 29. $9y^2 - 31y = 20$ _____ | 30. $2x^2 + 15x = -7$ _____ |
| 31. $5y^2 = 45$ _____ | 32. $9z^2 - z = 0$ _____ |
| 33. $5w^2 = 20w$ _____ | 34. $36a^2 = 169$ _____ |
| 35. $21r^2 - 13r - 20 = 0$ _____ | 36. $15t^2 - 11t - 12 = 0$ _____ |

5-8

Solve.

37. The length of an Olympic pool is 30 m greater than the width. If the area is 1000 m^2 , find the length and the width.

38. When the Great Pyramid of Khufu at Giza, Egypt, was built, the area of each face was $225,000 \text{ ft}^2$. The height was 150 ft less than the base. Find the length of the base and the height.

SKILLS PRACTICE 15

For use with Lessons 6-1 through 6-3

NAME _____

DATE _____

6-1

Simplify.

1. $\frac{12x^3}{6x}$ _____

2. $\frac{15a-5}{5}$ _____

3. $\frac{x^2-y^2}{x+y}$ _____

4. $\frac{a^3-b^3}{a-b}$ _____

5. $\frac{p^3+q^3}{p^2-pq+q^2}$ _____

6-1

Multiply or divide and simplify.

6. $\frac{x^2-25}{x^3} \cdot \frac{x^3+5x^2}{x^2-10x+25}$ _____

7. $\frac{p^3-q^3}{p^2-2pq+q^2} \cdot \frac{p^2-q^2}{p+q}$ _____

8. $\frac{a^2-8a+16}{a^2-10a+16} \cdot \frac{a^2-4}{a^2-16}$ _____

9. $\frac{x^2-9}{x^2} \div \frac{x+3}{x^3-3x^2}$ _____

10. $\frac{x^3-27}{x^3+27} \div \frac{x^2+3x+9}{x^2+6x+9}$ _____

11. $\frac{x^2-x-12}{x^2+8x+15} \div \frac{x^2+2x-24}{x^2+9x+20}$ _____

6-2

Add or subtract.

12. $\frac{8x^2}{y} + \frac{3x^2}{y}$ _____

13. $\frac{6x}{x-y} - \frac{-9x}{x-y}$ _____

14. $\frac{7x^2-3y}{a-b} + \frac{5x^2+4y}{b-a}$ _____

15. $\frac{x}{x-y} - \frac{2x}{x^2-y^2}$ _____

16. $\frac{2}{a^2-2a} - \frac{3}{a^2-a-2}$ _____

17. $\frac{3}{c^2+3c+2} - \frac{4}{c^2+4c+4}$ _____

18. $\frac{c}{c+1} - \frac{4}{c+4} + \frac{3}{c^2+5c+4}$ _____

19. $\frac{2x+1}{x^2+2x-15} - \frac{x}{x^2+x-20}$ _____

6-3

Simplify.

20. $\frac{1 + \frac{1}{x}}{1 - \frac{1}{x^2}}$ _____

21. $\frac{1 - \frac{4}{a^2}}{a+2}$ _____

22. $\frac{\frac{a^2-b^2}{ab}}{\frac{1}{a} + \frac{1}{b}}$ _____

23. $\frac{x^{-2}+x}{x^2-1}$ _____

24. $\frac{6a^{-1} - 3b^{-1} - 6a^{-1}b^{-1}}{6a^{-1} + 24b^{-1} + 12a^{-1}b^{-1}}$ _____

25. $\frac{\frac{x^2+5x-6}{x^2+8x+12}}{\frac{x^2+2x-15}{x^2+9x+20}}$ _____

SKILLS PRACTICE 16

Use with Lessons 6-4 through 6-6

NAME _____

DATE _____

Divide and check.

1. $(9x^5 - 3x^3 + 27x) \div 3x$ _____

2. $(24x^9 + 12x^6 - 32x^4) \div 4x^4$ _____

3. $(28a^3b^3 + 14ab^2 - 7a^2b) \div (-7ab)$ _____

4. $(2c^4d^4 - 12c^7d + 6c^3d^3) \div 2c^3d$ _____

5. $(y^2 + 12y + 36) \div (y + 6)$ _____

6. $(x^2 - 16) \div (x - 4)$ _____

7. $(a^3 - 27) \div (a - 3)$ _____

8. $(4x^4 + 11x^3 + 4x^2 - 3x + 2) \div (x + 2)$ _____

9. $(y^5 + 6y^3 - y^2 + 9y - 3) \div (y^2 + 3)$ _____

10. $(9y^4 - 9y^3 + 5y^2 - 4y + 2) \div (3y - 1)$ _____

6-5

Use synthetic division to find the quotient and remainder.

11. $(x^2 - 3x + 2) \div (x - 1)$ _____

12. $(x^2 - 3x + 2) \div (x + 1)$ _____

13. $(x^2 - x - 12) \div (x + 3)$ _____

14. $(3x^3 - 7x^2 + 2x - 4) \div (x - 3)$ _____

15. $(x^3 - x^2 - 12x + 4) \div (x + 3)$ _____

16. $(3x^3 - 7x^2 + 2x - 4) \div (x + 1)$ _____

17. $(4x^4 - 9x^3 - 7x^2 - 6x + 1) \div (x - 3)$ _____

18. $(2x^5 + 63) \div (x + 2)$ _____

6-6

Solve.

19. $\frac{2}{15} + \frac{1}{3} = \frac{x}{15}$ _____

20. $\frac{4}{3} - \frac{2}{5} = \frac{1}{x}$ _____

21. $\frac{y-6}{y-3} = \frac{2}{5}$ _____

22. $\frac{a+3}{a-5} = \frac{8}{a-5}$ _____

23. $\frac{3}{b} - \frac{5}{b} + \frac{17}{b} = 3$ _____

24. $\frac{4}{3y} - \frac{1}{4} = -\frac{1}{6y} + \frac{3}{2}$ _____

25. $\frac{4}{3x-5} = \frac{3}{2x}$ _____

26. $\frac{4}{3w} - \frac{2}{5w} = 1 - \frac{16}{15w}$ _____

SKILLS PRACTICE 21

For use with Lessons 8-1 through 8-3

NAME _____

DATE _____

8-1 Solve.

- | | | |
|-------------------------------------|--|---------------------------|
| 1. $x^2 - 8x + 7 = 0$ _____ | 2. $x^2 + 11x + 18 = 0$ _____ | |
| 3. $8x^2 - 2x - 3 = 0$ _____ | 4. $4y^2 + 9x - 9 = 0$ _____ | |
| 5. $9x^2 + 6x - 8 = 0$ _____ | 6. $(y + 4)(y - 1) = 24$ _____ | |
| 7. $4b(3b + 6) = -9$ _____ | 8. $4x(x + 1) = (2x + 3)(x - 5)$ _____ | |
| 9. $2x^2 + 5x = 12$ _____ | 10. $p(3p + 2) = 5$ _____ | 11. $3x^2 = 18$ _____ |
| 12. $-4t^2 + 3 = 0$ _____ | 13. $16x^2 + 25 = 0$ _____ | 14. $4x^2 + 12 = 0$ _____ |
| 15. $\frac{9}{16}x^2 - 1 = 0$ _____ | 16. $3x^2 = 10$ _____ | 17. $9x^2 + 25 = 0$ _____ |
| 18. $4x^2 + 20x = 0$ _____ | 19. $8x^2 - 5x = 0$ _____ | 20. $x^2 + 9x = 0$ _____ |

8-1 Solve by completing the square.

21. $x^2 + 4x = 1$ _____
22. $y^2 + 6y + 7 = 0$ _____
23. $x^2 + 7x + 1 = 0$ _____

8-2 Solve.

24. The width of a rectangular mural is 5 m less than the height. The area is 126 m^2 . Find the height and the width. _____
25. The outside of a picture frame measures 13 cm by 18 cm. 176 cm^2 of picture shows inside the frame. Find the width of the frame. _____
26. The outside of a picture frame measures 15 cm by 20 cm. 176 cm^2 of picture shows inside the frame. Find the width of the frame. _____

8-3 Solve.

- | | |
|-------------------------------|-------------------------------|
| 27. $x^2 + 6x + 2 = 0$ _____ | 28. $x^2 - 5x - 14 = 0$ _____ |
| 29. $t^2 + 4t = 21$ _____ | 30. $3p^2 + 2p - 5 = 0$ _____ |
| 31. $5x^2 = 13x - 6$ _____ | 32. $x^2 - 2x + 3 = 0$ _____ |
| 33. $m^2 + 11 = 6m$ _____ | 34. $x^2 + 7 = 0$ _____ |
| 35. $2x + x(x - 3) = 0$ _____ | 36. $4t^2 + 2t + 1 = 0$ _____ |

SKILLS PRACTICE 16

Problems 1-10 are 6-4 through 6-6

NAME _____

DATE _____

Divide and check.

1. $(9x^5 - 3x^3 + 27x) \div 3x$ _____

2. $(24x^9 + 12x^6 - 32x^4) \div 4x^4$ _____

3. $(28a^3b^3 + 14ab^2 - 7a^2b) \div (-7ab)$ _____

4. $(2c^4d^4 - 12c^7d + 6c^3d^3) \div 2c^3d$ _____

5. $(y^2 + 12y + 36) \div (y + 6)$ _____

6. $(x^2 - 16) \div (x - 4)$ _____

7. $(a^3 - 27) \div (a - 3)$ _____

8. $(4x^4 + 11x^3 + 4x^2 - 3x + 2) \div (x + 2)$ _____

9. $(y^5 + 6y^3 - y^2 + 9y - 3) \div (y^2 + 3)$ _____

10. $(9y^4 - 9y^3 + 5y^2 - 4y + 2) \div (3y - 1)$ _____

6-5 Use synthetic division to find the quotient and remainder.

11. $(x^2 - 3x + 2) \div (x - 1)$ _____

12. $(x^2 - 3x + 2) \div (x + 1)$ _____

13. $(x^2 - x - 12) \div (x + 3)$ _____

14. $(3x^3 - 7x^2 + 2x - 4) \div (x - 3)$ _____

15. $(x^3 - x^2 - 12x + 4) \div (x + 3)$ _____

16. $(3x^3 - 7x^2 + 2x - 4) \div (x + 1)$ _____

17. $(4x^4 - 9x^3 - 7x^2 - 6x + 1) \div (x - 3)$ _____

18. $(2x^5 + 63) \div (x + 2)$ _____

6-6 Solve.

19. $\frac{2}{15} + \frac{1}{3} = \frac{x}{15}$ _____

20. $\frac{4}{3} - \frac{2}{5} = \frac{1}{x}$ _____

21. $\frac{y-6}{y-3} = \frac{2}{5}$ _____

22. $\frac{a+3}{a-5} = \frac{8}{a-5}$ _____

23. $\frac{3}{b} - \frac{5}{b} + \frac{17}{b} = 3$ _____

24. $\frac{4}{3y} - \frac{1}{4} = -\frac{1}{6y} + \frac{3}{2}$ _____

25. $\frac{4}{3x-5} = \frac{3}{2x}$ _____

26. $\frac{4}{3w} - \frac{2}{5w} = 1 - \frac{16}{15w}$ _____

8-6 Solve for the indicated letter.

1. $V = hw^2$; w _____
2. $x = \frac{1}{2}at^2$; t _____
3. $\sqrt{\frac{F}{k}} = x$; F _____
4. $F = \frac{kq_1q_2}{r^2}$; r _____
5. $P = I^2R$; I _____
6. $P = \frac{V^2}{R}$; V _____
7. $h = 2v + 10t^2$; t _____
8. $x = \frac{1}{2}at^2 + vt$; t _____
9. $t^2 + 3g = \pi t$; t _____

8-6 Solve. Use the formula $s = 0.8t^2 + v_0t$ (for objects falling to the moon).

10. a. If an object is dropped from an orbiting spacecraft that is 5000 m above the surface of the moon, how long does it take to reach the ground?
 b. If the spacecraft's initial downward velocity is 100 m/s and the braking rockets fail to fire, how long does it take the spacecraft to reach the ground?
 c. If the braking rockets fire, the equation of motion changes to $s = -\frac{1}{2}t^2 + 100t$. How far will the spacecraft fall in 100 seconds?

8-7 Find an equation of variation where

11. y varies directly as the square of x , and $y = 80$ when $x = 4$. _____
12. y varies inversely as the square of x , and $y = 5$ when $x = 3$. _____
13. z varies jointly as x and y , and $z = 42$ when $x = 2$ and $y = 7$. _____
14. z varies directly as x and inversely as y , and $z = 1$ when $x = 4$ and $y = 4$. _____
15. w varies jointly as x and y and inversely as the square of z , and $w = 9$ when $x = 3$, $y = 6$, and $z = 2$.

8-7 Solve.

16. The force (F) due to gravity varies inversely as the square of the distance (r) between two objects. If the gravitational force between Peter and Rocío is 50 dynes when they are 2 cm apart, find the force of attraction when they are 10 cm apart.

SKILLS PRACTICE 26

For use with Lessons 9-6 through 9-8

NAME _____

DATE _____

9-6 For each function find standard form, the vertex, the line of symmetry, and the maximum or minimum value.

1. $f(x) = x^2 - 6x + 13$ _____

2. $f(x) = -x^2 - 4x - 6$ _____

3. $f(x) = -3x^2 + 6x - 1$ _____

4. $f(x) = 2x^2 + 16x + 29$ _____

9-6 Solve.

5. A farmer is subdividing a portion of his farm for his livestock. He will make the area rectangular and will fix the perimeter at 100 m with fencing he already owns. What dimensions would yield the maximum area? What is the maximum area? _____

9-7 Find the x -intercepts.

6. $f(x) = x^2 + 2x - 15$ _____

7. $f(x) = 9x^2 + 12x + 4$ _____

8. $f(x) = x^2 - 4x + 2$ _____

9. $f(x) = x^2 + 6x + 10$ _____

10. $f(x) = x^2 + 4x + 13$ _____

11. $f(x) = 4x^2 + 20x + 25$ _____

9-8 Find the quadratic function that fits each set of data points.

12. (1, 2), (3, 14), (-1, 14) _____

13. (0, 5), (2, 15), (-2, 3) _____

14. (1, 7), (-1, -7), (-2, -8) _____

15. (1, 3), (2, 12), (-1, 9) _____

9-8 Solve.

16. A new floral shop makes a gross profit of \$600 in its first month, \$400 in its third month, and \$1000 in its fifth month. The owner plots the points (1, 600), (3, 400), and (5, 1000).

a. Find a quadratic function that fits the data. _____

b. Predict how much gross profit the shop will make in its seventh month. _____

8-6 Solve for the indicated letter.

1. $V = hw^2$; w _____

2. $x = \frac{1}{2}at^2$; t _____

3. $\sqrt{\frac{F}{k}} = x$; F _____

4. $F = \frac{kq_1q_2}{r^2}$; r _____

5. $P = I^2R$; I _____

6. $P = \frac{V^2}{R}$; V _____

7. $h = 2v + 10t^2$; t _____

8. $x = \frac{1}{2}at^2 + vt$; t _____

9. $t^2 + 3g = \pi t$; t _____

8-6 Solve. Use the formula $s = 0.8t^2 + v_0t$ (for objects falling to the moon).

10. a. If an object is dropped from an orbiting spacecraft that is 5000 m above the surface of the moon, how long does it take to reach the ground? _____

b. If the spacecraft's initial downward velocity is 100 m/s and the braking rockets fail to fire, how long does it take the spacecraft to reach the ground? _____

c. If the braking rockets fire, the equation of motion changes to $s = -\frac{1}{2}t^2 + 100t$. How far will the spacecraft fall in 100 seconds? _____

8-7 Find an equation of variation where

11. y varies directly as the square of x , and $y = 80$ when $x = 4$. _____

12. y varies inversely as the square of x , and $y = 5$ when $x = 3$. _____

13. z varies jointly as x and y , and $z = 42$ when $x = 2$ and $y = 7$. _____

14. z varies directly as x and inversely as y , and $z = 1$ when $x = 4$ and $y = 4$. _____

15. w varies jointly as x and y and inversely as the square of z , and $w = 9$ when $x = 3$, $y = 6$, and $z = 2$. _____

8-7 Solve.

16. The force (F) due to gravity varies inversely as the square of the distance (r) between two objects. If the gravitational force between Peter and Rocío is 50 dynes when they are 2 cm apart, find the force of attraction when they are 10 cm apart. _____

SKILLS PRACTICE 26

For use with Lessons 9-6 through 9-8

NAME _____

DATE _____

9-6

For each function find standard form, the vertex, the line of symmetry, and the maximum or minimum value.

1. $f(x) = x^2 - 6x + 13$ _____

2. $f(x) = -x^2 - 4x - 6$ _____

3. $f(x) = -3x^2 + 6x - 1$ _____

4. $f(x) = 2x^2 + 16x + 29$ _____

9-6

Solve.

5. A farmer is subdividing a portion of his farm for his livestock. He will make the area rectangular and will fix the perimeter at 100 m with fencing he already owns. What dimensions would yield the maximum area? What is the maximum area? _____

9-7

Find the x -intercepts.

6. $f(x) = x^2 + 2x - 15$ _____

7. $f(x) = 9x^2 + 12x + 4$ _____

8. $f(x) = x^2 - 4x + 2$ _____

9. $f(x) = x^2 + 6x + 10$ _____

10. $f(x) = x^2 + 4x + 13$ _____

11. $f(x) = 4x^2 + 20x + 25$ _____

9-8

Find the quadratic function that fits each set of data points.

12. (1, 2), (3, 14), (-1, 14) _____

13. (0, 5), (2, 15), (-2, 3) _____

14. (1, 7), (-1, -7), (-2, -8) _____

15. (1, 3), (2, 12), (-1, 9) _____

9-8

Solve.

16. A new floral shop makes a gross profit of \$600 in its first month, \$400 in its third month, and \$1000 in its fifth month. The owner plots the points (1, 600), (3, 400), and (5, 1000).

a. Find a quadratic function that fits the data. _____

b. Predict how much gross profit the shop will make in its seventh month. _____

SKILLS PRACTICE 39

For use with Lessons 14-1 through 14-2

NAME _____

DATE _____

14-1 The general term of a sequence is given. Find the 12th term.

1. $a_n = 4n + 3$ _____ 2. $a_n = n - \frac{1}{n}$ _____ 3. $a_n = (-1)^n 2^{n-7}$ _____

14-1 For each sequence find a general term.

4. $\sqrt{3}, \sqrt{6}, \sqrt{9}, \sqrt{12}, \sqrt{15}, \dots$ _____ 5. $\frac{2}{1}, \frac{3}{2}, \frac{4}{3}, \frac{5}{4}, \frac{6}{5}, \dots$ _____
6. $-2, 5, -8, 11, -14, \dots$ _____ 7. $\log 1, \log 2, \log 4, \log 8, \log 16, \dots$ _____

14-1 Find S_2 and S_4 for each sequence.

8. $1, 10, 100, 1000, 10,000, \dots$ _____ 9. $3, 6, 9, 12, 15, \dots$ _____

14-1 Rename and evaluate each sum.

10. $\sum_{n=1}^5 \frac{1}{3}n$ _____ 11. $\sum_{n=3}^6 \sqrt{2n+3}$ _____

14-1 Write sigma notation for each sum.

12. $1 + 4 + 7 + 10 + 13$ _____ 13. $\frac{1}{4} - \frac{1}{9} + \frac{1}{16} - \frac{1}{25} + \frac{1}{36} - \frac{1}{49}$ _____

14-2 Find the specified term of the given arithmetic sequences.

14. 10th term of $3, 5, 7, \dots$ _____ 15. 12th term of $0.16, 0.11, 0.06, \dots$ _____

14-2 In the given sequences, what term has the specified value?

16. $1, 4, 7, \dots$; 34 _____ 17. $0.03, 0.07, 0.11, \dots$; 0.51 _____

14-2 Insert three arithmetic means between each pair of numbers.

18. 8 and 28 _____ 19. 2 and 14 _____ 20. 10 and 34 _____

14-2 Find the sum of the numbers described.

21. The even numbers from 4 to 40, inclusive _____
22. The odd numbers from 1 to 111, inclusive _____

14-2 Find the sum of each series.

23. $\sum_{n=1}^{12} (2n - 5)$ _____ 24. $\sum_{n=1}^{20} 4n$ _____ 25. $\sum_{n=1}^{18} n$ _____

SKILLS PRACTICE 35

For use with Lessons 12-7 through 12-8

NAME _____

DATE _____

12-7 Solve.

1. $2^x = 64$ _____ 2. $3^x = 243$ _____ 3. $3^{2x+3} = 81$ _____
4. $5^{3x} = 125$ _____ 5. $8^x = 4$ _____ 6. $2^x = \frac{1}{8}$ _____
7. $3^x = 5^{x-1}$ _____ 8. $(54)^{3x} = 19$ _____ 9. $(7.4)^x = 18.6$ _____

12-7 Solve.

10. $\log_3(2x + 5) = 2$ _____ 11. $\log_5(4x - 1) = 3$ _____
12. $\log \sqrt{x^2 - 1} = 2$ _____ 13. $\log(x + 9) - \log x = 1$ _____
14. $\log_2 x + \log_2(x + 3) = 2$ _____ 15. $\log_6 x + \log_6(x + 5) = 2$ _____

12-7 Solve.

16. How many years will it take an investment of \$1000 to double itself when interest is compounded annually at 4%?

17. Find the loudness in decibels of the sound of a tractor having an intensity of 7,400,000 times I_0 .

12-8 Graph.

18. $y = e^{x\sqrt{3}}$ 19. $y = e^{-x\sqrt{3}}$

12-8 Find each natural logarithm: Use a calculator or Table 3.

20. $\ln 4.32$ _____ 21. $\ln 43.2$ _____ 22. $\ln 432$ _____
23. $\ln 0.432$ _____ 24. $\ln 8700$ _____ 25. $\ln 93,000$ _____

12-8 Solve.

26. The approximate population of Albuquerque was 330,000 in 1980. In 1985 it was 370,000. Estimate the population in the year 2000.

27. The half-life of a lead isotope is 22 years. After 88 years, how much of a 2000-gram sample will remain as the original isotope?

12-8 Use common (base 10) logarithms to find the following.

28. $\log_6 25$ _____ 29. $\log_5 0.27$ _____ 30. $\log_8 39$ _____
31. $\log_{11} 14,000$ _____ 32. $\ln 14$ _____ 33. $\ln 0.52$ _____