

Answers

2.3 Enrichment and Extension

1. $x = \frac{a^2}{4}y^2$

2. $y = \frac{n}{8}x^2$

3. $y = \frac{b}{12}x^2$

4. $x = \frac{3n}{2}y^2$

5. \overline{RS} has a slope of

$$\frac{s^2 - r^2}{s - r} = \frac{(s - r)(s + r)}{s - r} = s + r = r + s.$$

$$\overline{OT} \text{ has a slope of } \frac{t^2 - 0}{t - 0} = \frac{t^2}{t} = t.$$

Because \overline{RS} and \overline{OT} are parallel lines, their slopes are equal.

$$\text{So, } r + s = t.$$

6. To find the midpoint of a line segment, find the average of the x -values and y -values of the endpoints.

The x -value of the midpoint of \overline{RS} would be

$$\frac{r + s}{2}.$$

The x -value of the midpoint \overline{OT} would be $\frac{t}{2}$.

The x -value of the midpoint \overline{UV} would be $\frac{u + v}{2}$.

\overline{UV} has as slope of

$$\frac{v^2 - u^2}{v - u} = \frac{(v - u)(v + u)}{v - u} = v + u = u + v.$$

Because \overline{UV} is parallel to both \overline{RS} and \overline{OT} , all slopes are equal and $u + v = r + s = t$.

So, the x -values of their midpoints are all the same

and lie on the same line, $x = \frac{t}{2}$ or $x = \frac{r + s}{2}$

$$\text{or } x = \frac{u + v}{2}.$$

2.3 Puzzle Time

WITH A COW-CULATOR

2.4 Cumulative Practice

1. minimum; 4

2. Maximum; 7

2.4 Prerequisite Skills Practice

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

2. $y + 1 = -3(x - 6)$

2.4 Extra Practice

1. $y = -\frac{1}{9}(x - 1)^2 - 6$ 2. $-\frac{9}{49}(x + 2)^2 + 5$

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

4. $y = -\frac{5}{3}(x - 12)(x - 8)$

5. $y = \frac{1}{16}(x + 7)(x + 1)$

6. $y = -\frac{4}{81}(x + 9)(x - 9)$

7. The two given sets of coordinates were not substituted into the correct places.

$$y = a(x - h)^2 + k$$

$$-7 = a(1 - 3)^2 - 5$$

$$-7 = 4a - 5$$

$$-2 = 4a$$

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

The equation is $y = -\frac{1}{2}(x - 3)^2 - 5$.

8. a. The maximum area of 2500 square feet occurs when the length is 50 feet.

b. $A(x) = -x^2 + 100x$; $A(2) = 196 \text{ ft}^2$

9. $y = 0.1x^2 - 2x + 22$; \$12

2.4 Reteach

1. $y = \frac{7}{16}(x - 2)^2 - 3$ 2. $y = -\frac{1}{18}(x - 3)^2 - 8$

3. $y = -9(x + 1)^2 + 4$ 4. $y = \frac{8}{5}(x - 10)(x - 6)$

5. $y = \frac{3}{16}(x - 2)(x - 8)$

6. $y = -\frac{2}{7}(x + 14)(x + 2)$

2.4 Enrichment and Extension

1. linear; $y = -1.8x + 212.10$

2. quadratic

a. $y = -4.9x^2 + 19.6x + 58.8$

b. $y = -4.9(x - 2)^2 + 78.4$

c. The graph of the function is a reflection in the x -axis, followed by a vertical stretch by a factor of 4.9 and a translation 2 units right and 78.4 units up of its parent function.

Answers

3. quadratic

a. $y = -3x^2 + 30x + 12$

b. $y = -3(x - 5)^2 + 87$

c. The graph of the function is a reflection in the x -axis, followed by a vertical stretch by a factor of 3 and a translation 5 units right and 87 units up of its parent function.

4. linear; $y = 0.433x + 14.7$

5. quadratic

a. $y = -5x^2 + 14x + 3$

b. $y = -5(x - 1.4)^2 + 12.8$

c. The graph of the function is a reflection in the x -axis, followed by a vertical stretch by a factor of 5 and a translation 1.4 units right and 12.8 units up of its parent function.

2.4 Puzzle Time

A BREAD SPREAD

Chapter 3

3.1 Cumulative Practice

- quadratic; domain: all real numbers, range: $y \leq 1$
- quadratic; domain: all real numbers, range: $y \geq -1$

3.1 Prerequisite Skills Practice

- $(-3, 4)$; Explanations will vary.
- $(\frac{3}{11}, -\frac{21}{11})$; Explanations will vary.

3.1 Extra Practice

- $x = 1$ and $x = -1$
- $x = 1$ and $x = -\frac{1}{3}$
- $x = -7$ and $x = 2$
- $x = \frac{3}{4}$ and $x = -3$
- $x = -2$ and $x = 6$
- $x = -3$ and $x = -6$
- $k = 14$ and $k = -8$
- $x = -1 + \sqrt{3}$ and $x = -1 - \sqrt{3}$
- $x = 3$ and $x = -3$

10. Sample answer:

a. $(x - 2)^2 + 4 = 20$

b. $(x - 3)^2 + 4 = 10$

c. $(x - 2)^2 + 10 = 4$

11. $x = 11$ and $x = -11$ 12. $k = 9$ and $k = 0$

13. $w = 5$ and $w = -2$ 14. $y = 0$ and $y = 3$

15. $x = \frac{2}{5}$ and $x = \frac{3}{5}$; Sample answer: Quadratic Formula; The trinomial contains fractions.

16. $n = 1.3$ and $n = -1.3$; Sample answer: square root property; There is no linear term.

17. 2 and -9 18. 4 and -4

19. 0 and 13 20. $\frac{4}{3}$

21. \$30 per rental; \$720

22. $h(t) = -16t^2 + 15$; $t \approx 0.968$ sec

3.1 Reteach

- $x = 5$ and $x = 1$ 2. $x = -2$ and $x = 6$
- $x = 3$ and $x = -\frac{1}{2}$
- a. $t = 10$ and $t = -10$
b. $g = 8$ and $g = -8$
c. $y = \pm 3\sqrt{2}$
- $x = 2$ and $x = -2$ 6. $x = 2$ and $x = -3$
- $m = 0$ and $m = -4$

3.1 Enrichment and Extension

- 12 units 2. 16 in.
- -3 or 2 4. 7 units by 15 units
- 16 and 14 or -14 and -16
- 8 and 9 or -9 and -8
- -24 and -22 or 22 and 24
- 16 and 9 9. 15 years old
- 15 units by 17 units 11. 1 ft