CUMULATIVE REVIEW Chapters 1-8, pages 701–712

1

1. Identify this series as arithmetic or geometric, then determine its sum.
$4 + 2.5 + 1 + \ldots -32$

The series is arithmetic because each term is 1.5 less than the preceding term. Use $t_n = t_1 + d(n - 1)$ to determine n.
Substitute: $t_n = -32$, $t_1 = 4$, $d = -1.5$

$-32 = 4 - 1.5(n - 1)$
$36 = 1.5(n - 1)$
$24 = n - 1$
$n = 25$

Use: $S_n = \dfrac{n(t_1 + t_n)}{2}$ Substitute: $n = 25$, $t_1 = 4$, $t_n = -32$

$S_{25} = \dfrac{25(4 - 32)}{2}$
$S_{25} = -350$

2

2. Solve each equation. Verify the roots.

a) $\sqrt{5x + 1} = \sqrt{3x + 8}$

$x \geq -\frac{1}{5}$; $x \geq -\frac{8}{3}$;
so, $x \geq -\frac{1}{5}$
$5x + 1 = 3x + 8$
$2x = 7$
$x = 3.5$
Verify. L.S. = R.S., so the root is $x = 3.5$.

b) $4 - 5\sqrt{2x} = 8 - 3\sqrt{2x}$

$x \geq 0$
$-4 = 2\sqrt{2x}$
The square root cannot be negative, so there is no solution.

3

3. Solve each quadratic equation.

a) $(x - 2)(2x - 3) = 4$

$2x^2 - 3x - 4x + 6 - 4 = 0$
$2x^2 - 7x + 2 = 0$
Substitute:
$a = 2, b = -7, c = 2$
in:
$x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
$x = \dfrac{7 \pm \sqrt{(-7)^2 - 4(2)(2)}}{2(2)}$
$x = \dfrac{7 \pm \sqrt{33}}{4}$

b) $x(4x + 1) = 4(5 - 2x^2)$

$4x^2 + x = 20 - 8x^2$
$12x^2 + x - 20 = 0$
Use decomposition.
$12x^2 + 16x - 15x - 20 = 0$
$4x(3x + 4) - 5(3x + 4) = 0$
$(3x + 4)(4x - 5) = 0$
Either $3x + 4 = 0$
$x = -\frac{4}{3}$
Or $4x - 5 = 0$
$x = \frac{5}{4}$

4

4. An outdoor theatre sells 800 tickets for a show at $26 per ticket. A survey indicates that if the ticket price is decreased, the number of tickets sold will increase by 50 for each $1 decrease.
What ticket price will maximize the revenue?
What is the maximum revenue?

Write a function.
For each $1 decrease in price, 50 more tickets will be sold.
Let x represent the number of $1 decreases in price.

Price of a Ticket ($)	Number of Tickets Sold	Revenue ($)
26	800	$26(800) = 20\ 800$
$26 - (1) = 25$	$800 + 50(1) = 850$	$25(850) = 21\ 250$
$26 - (2) = 24$	$800 + 50(2) = 900$	$24(900) = 21\ 600$
$26 - x$	$800 + 50x$	$(26 - x)(800 + 50x)$

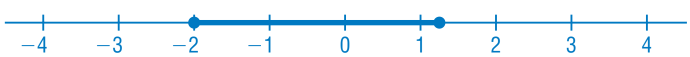
Let the revenue be R dollars.
A function is: $R = (26 - x)(800 + 50x)$
Use a graphing calculator to graph this function.
Use the CALC feature to determine the coordinates of the vertex: (5, 22 050)
The ticket price, in dollars, is: $26 - 5 = 21$
The maximum revenue is: $22 050

5

5. Graph each inequality.

a) $4x^2 + 3x \leq 10$

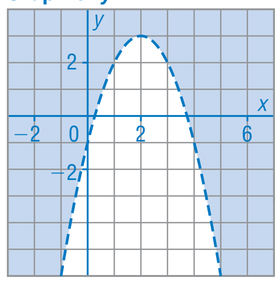
Solve: $4x^2 + 3x = 10$
$4x^2 + 3x - 10 = 0$
$(4x - 5)(x + 2) = 0$
$x = 1.25$ or $x = -2$
When $x \leq -2$, such as $x = -3$, L.S. = 27; R.S. = 10; so $x = -3$ does not satisfy the inequality.
When $-2 \leq x \leq 1.25$, such as $x = 0$, L.S. = 0; R.S. = 10; so $x = 0$ does satisfy the inequality.
The solution is: $-2 \leq x \leq 1.25$, $x \in \mathbb{R}$



b) $y > -x^2 + 4x - 1$

Graph the related quadratic function:
$y = -x^2 + 4x - 1$
$y = -(x^2 - 4x + 4 - 4) - 1$
$y = -(x - 2)^2 + 4 - 1$
$y = -(x - 2)^2 + 3$
The graph opens down, is congruent to $y = -x^2$, and has vertex (2, 3).
The curve is broken; shade the region above the curve.

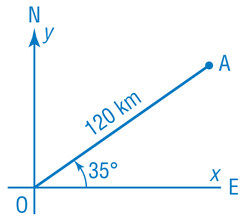
Graph of $y > -x^2 + 4x - 1$



6

6. An aircraft is 120 km from a radar antenna, in a direction E35°N. To the nearest kilometre, how far is the aircraft due east and due north of the antenna?

Sketch a diagram.
The distance due east is the x-coordinate of A.
$x = r \cos \theta$ Substitute: $r = 120$, $\theta = 35°$
$x = 120 \cos 35°$
$x = 98.2982...$
The distance due north is the y-coordinate of A.
$y = r \sin \theta$ Substitute: $r = 120$, $\theta = 35°$
$y = 120 \sin 35°$
$y = 68.8291...$
The aircraft is approximately 98 km east and 69 km north.



7. To the nearest degree, what values of α satisfy each equation for $0° \leq \alpha \leq 360°$?

a) $\tan \alpha = \frac{9}{7}$

In Quadrant 1, $\alpha = \tan^{-1}\left(\frac{9}{7}\right)$
$\alpha = 52.1250...°$
$\alpha \doteq 52°$
tan α is also positive in Quadrant 3, where α is approximately:
$180° + 52° = 232°$

b) $\cos \alpha = -0.3$

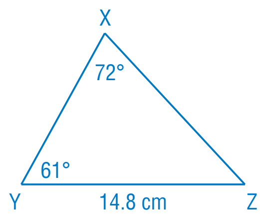
In Quadrant 1, $\alpha = \cos^{-1}(0.3)$
$\alpha = 72.5243...°$
$\alpha \doteq 73°$
cos α is negative in Quadrants 2 and 3, so
α is approximately: $180° - 73° = 107°$
α is approximately: $180° + 73° = 253°$

8. Solve each triangle. Give the angle measures to the nearest degree and the side lengths to the nearest tenth of a centimetre.

a) In ΔXYZ, $\angle X = 72°$, $YZ = 14.8$ cm, and $\angle Y = 61°$

Sketch a diagram. Since 2 angles are given, only 1 triangle is possible.

$\angle Z = 180° - (72° + 61°)$
$= 47°$



To determine XY

Use: $\dfrac{z}{\sin Z} = \dfrac{x}{\sin X}$

Substitute:

$\angle Z = 47°$, $\angle X = 72°$,

$x = 14.8$

$\dfrac{z}{\sin 47°} = \dfrac{14.8}{\sin 72°}$

$z = \dfrac{14.8 \sin 47°}{\sin 72°}$

$z = 11.3810\ldots$

XY is approximately 11.4 cm.

To determine XZ

Use: $\dfrac{y}{\sin Y} = \dfrac{x}{\sin X}$

Substitute:

$\angle Y = 61°$, $\angle X = 72°$,

$x = 14.8$

$\dfrac{y}{\sin 61°} = \dfrac{14.8}{\sin 72°}$

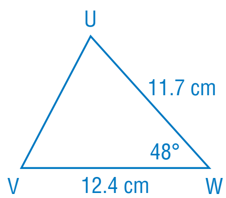
$y = \dfrac{14.8 \sin 61°}{\sin 72°}$

$y = 13.6105\ldots$

XZ is approximately 13.6 cm.

b) In ΔUVW, $\angle W = 48°$, $VW = 12.4$ cm, and $UW = 11.7$ cm

Sketch a diagram. Since 2 sides and the contained angle are given, only 1 triangle is possible.



To determine UV, use:

$w^2 = u^2 + v^2 - 2uv \cos W$

Substitute: $u = 12.4$, $v = 11.7$, $\angle W = 48°$

$w^2 = 12.4^2 + 11.7^2 - 2(12.4)(11.7) \cos 48°$

$w = \sqrt{12.4^2 + 11.7^2 - 2(12.4)(11.7) \cos 48°}$

$w = 9.8231\ldots$

So, $UV \doteq 9.8$ cm

To determine $\angle V$, use:

$\dfrac{\sin V}{v} = \dfrac{\sin W}{w}$

Substitute: $\angle W = 48°$, $v = 11.7$, $w = 9.8231\ldots$

$\dfrac{\sin V}{11.7} = \dfrac{\sin 48°}{9.8231\ldots}$

$\sin V = \dfrac{11.7 \sin 48°}{9.8231\ldots}$

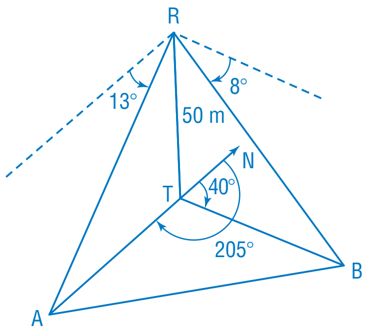
$\angle V = \sin^{-1}\left(\dfrac{11.7 \sin 48°}{9.8231\ldots}\right)$

$\angle V = 62.2674\ldots°$

$\angle V \doteq 62°$

And, $\angle U \doteq 180° - (62° + 48°)$
$\doteq 70°$

9. From the top of a 50-m observation tower, a fire ranger observes smoke in two locations. One is on a bearing of 040° with an angle of depression of 8°, and the other is on a bearing of 205° with an angle of depression of 13°. To the nearest metre, how far apart are the sources of smoke?



The diagram is not drawn to scale.

Sketch a diagram.
The smoke is at points A and B.
The distance between the sources of smoke is AB.
In ΔTRA, ∠R is: 90° − 13° = 77°

$\tan 77° = \frac{AT}{50}$

$AT = 50 \tan 77°$

In ΔTRB, ∠R is: 90° − 8° = 82°

$\tan 82° = \frac{BT}{50}$

$BT = 50 \tan 82°$

In ΔTAB, ∠T is: 205° − 40° = 165°

Use: $t^2 = a^2 + b^2 - 2ab \cos T$

Substitute: $a = 50 \tan 82°$, $b = 50 \tan 77°$, $\angle T = 165°$

$t^2 = (50 \tan 82°)^2 + (50 \tan 77°)^2 - 2(50 \tan 82°)(50 \tan 77°) \cos 165°$

$t^2 = 50^2 [(\tan 82°)^2 + (\tan 77°)^2 - 2(\tan 82°)(\tan 77°) \cos 165°]$

$t = 50\sqrt{(\tan 82°)^2 + (\tan 77°)^2 - 2(\tan 82°)(\tan 77°) \cos 165°}$

$t = 567.7365...$

The sources of smoke are approximately 568 m apart.

7

10. Determine the non-permissible values for each rational expression, then simplify it.

a) $\frac{16a^3b^4}{-8a^5b}$

$= \frac{{}^{2}\cancel{16}\,\cancel{a^3}\,\cancel{b^4}^{3}}{-{}^{1}\cancel{8}\,\cancel{a^5}^{2}\,\cancel{b}}$

$= \frac{-2b^3}{a^2}$, $a, b \neq 0$

b) $\frac{2x^2 - 7x - 15}{6x^2 + 13x + 6}$

$= \frac{\cancel{(2x + 3)}(x - 5)}{\cancel{(2x + 3)}(3x + 2)}$

$= \frac{x - 5}{3x + 2}$, $x \neq -\frac{3}{2}, -\frac{2}{3}$

11. Simplify each expression.

a) $\dfrac{6a^2 - 26a - 20}{a^2 - 12a + 35} \cdot \dfrac{2a^2 - 9a - 35}{3a^2 + 20a + 12}$

$$= \frac{2\cancel{(3a + 2)}\cancel{(a - 5)}}{\cancel{(a - 5)}\cancel{(a - 7)}} \cdot \frac{(2a + 5)\cancel{(a - 7)}}{\cancel{(3a + 2)}(a + 6)}$$

$$= \frac{2(2a + 5)}{a + 6}, a \neq -6, -\frac{2}{3}, 5, 7$$

b) $\dfrac{8y^2 - 20y - 48}{6y^2 - 7y - 3} \div \dfrac{24y^2 - 88y - 32}{4y^2 - 12y + 9}$

$$= \frac{4(2y^2 - 5y - 12)}{(2y - 3)(3y + 1)} \div \frac{8(3y^2 - 11y - 4)}{(2y - 3)(2y - 3)}$$

$$= \frac{4(2y + 3)(y - 4)}{(2y - 3)(3y + 1)} \div \frac{8(3y + 1)(y - 4)}{(2y - 3)(2y - 3)}$$

$$= \frac{\cancel{4}(2y + 3)\cancel{(y - 4)}}{\cancel{(2y - 3)}(3y + 1)} \cdot \frac{\cancel{(2y - 3)}(2y - 3)}{{}^{2}\cancel{8}(3y + 1)\cancel{(y - 4)}}$$

$$= \frac{(2y + 3)(2y - 3)}{2(3y + 1)^2}, y \neq -\frac{1}{3}, \frac{3}{2}, 4$$

12. Simplify.

a) $\dfrac{9a}{7b^2} + \dfrac{3a^2b}{4ab^2} - \dfrac{8b^4}{3ab^3}$

Simplify each rational expression before adding or subtracting.

$$\frac{9a}{7b^2} + \frac{3a^{\cancel{2}}\cancel{b}}{4\cancel{a}b^{\cancel{2}}} - \frac{8b^{\cancel{4}}}{3a\cancel{b^3}}$$

$$= \frac{9a}{7b^2} \cdot \frac{12a}{12a} + \frac{3a}{4b} \cdot \frac{21ab}{21ab} - \frac{8b}{3a} \cdot \frac{28b^2}{28b^2}$$

$$= \frac{108a^2 + 63a^2b - 224b^3}{84ab^2}, a, b \neq 0$$

b) $\dfrac{x^2 - 1}{x^2 + 7x + 6} + \dfrac{x^2 + 5x - 14}{x^2 - 2x - 3}$

$$= \frac{x^2 - 1}{(x + 1)(x + 6)} + \frac{x^2 + 5x - 14}{(x + 1)(x - 3)}$$

$$= \frac{(x^2 - 1)}{(x + 1)(x + 6)} \cdot \frac{(x - 3)}{(x - 3)} + \frac{(x^2 + 5x - 14)}{(x + 1)(x - 3)} \cdot \frac{(x + 6)}{(x + 6)}$$

$$= \frac{x^3 - 3x^2 - x + 3 + x^3 + 6x^2 + 5x^2 + 30x - 14x - 84}{(x + 1)(x + 6)(x - 3)}$$

$$= \frac{2x^3 + 8x^2 + 15x - 81}{(x + 1)(x + 6)(x - 3)}, x \neq -6, -1, 3$$

13. Solve each equation.

a) $\frac{x + 3}{x - 1} = \frac{8}{2x^2 - 2x}$

$$\frac{x + 3}{x - 1} = \frac{8}{2x(x - 1)}$$

$$2x\cancel{(x - 1)}\left(\frac{x + 3}{\cancel{x - 1}}\right) = \left(\frac{8}{\cancel{2x(x - 1)}}\right)\cancel{2x(x - 1)}, x \neq 0, 1$$

$$2x^2 + 6x - 8 = 0$$
$$x^2 + 3x - 4 = 0$$
$$(x - 1)(x + 4) = 0$$

So, $x = 1$ or $x = -4$

Since $x = 1$ is a non-permissible value, the solution is $x = -4$.

b) $\frac{6}{m^2 - 25} = \frac{18}{2m^2 - 2m - 12}$ Divide by 6.

$\frac{1}{(m - 5)(m + 5)} = \frac{3}{2(m - 3)(m + 2)}$, $m \neq -5, -2, 3, 5$

Multiply each side by the common denominator:

$2(m - 5)(m + 5)(m - 3)(m + 2)$

$$2(m - 3)(m + 2) = 3(m - 5)(m + 5)$$
$$2m^2 - 2m - 12 = 3m^2 - 75$$
$$m^2 + 2m - 63 = 0$$
$$(m + 9)(m - 7) = 0$$

So, $m = -9$ or $m = 7$

14. Write an equation to model the following situation, then solve the equation.

Pump 1 can empty a swimming pool in 12 h. When Pump 2 is used as well, the pool is emptied in 7.5 h. How long would it take for Pump 2 alone to empty the pool?

Let the volume of the pool be V litres and the time it takes Pump 2 to empty the pool be t hours.

The rate at which the pool is emptied by:

Pump 1 is: $\frac{V}{12}$ litres per hour

Pump 2 is: $\frac{V}{t}$ litres per hour

Pump 1 and Pump 2 together: $\frac{V}{7.5}$

An equation is: $\frac{V}{12} + \frac{V}{t} = \frac{V}{7.5}$ Divide by V.

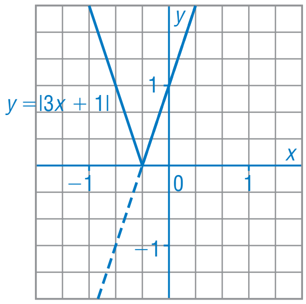
$\frac{1}{12} + \frac{1}{t} = \frac{1}{7.5}$ Multiply by $90t$.

$$90t\left(\frac{1}{12}\right) + 90t\left(\frac{1}{t}\right) = 90t\left(\frac{1}{7.5}\right)$$
$$7.5t + 90 = 12t$$
$$4.5t = 90$$
$$t = 20$$

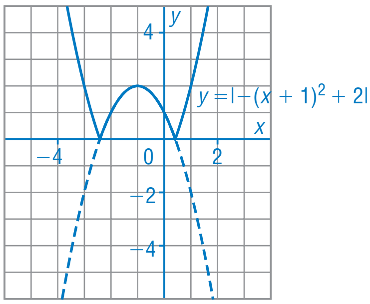
Pump 2 alone can empty the pool in 20 h.

15. Sketch a graph of each absolute value function. Identify the domain and range of the function.

a) $y = |3x + 1|$ b) $y = |-(x + 1)^2 + 2|$



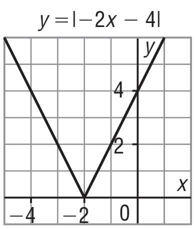
Draw the graph of $y = 3x + 1$. It has x-intercept $-\frac{1}{3}$. Reflect, in the x-axis, the part of the graph that is below the x-axis.
From the graph, the domain of $y = |3x + 1|$ is $x \in \mathbb{R}$, and the range is $y \geq 0$.



The graph of $y = -(x + 1)^2 + 2$ opens down with vertex $(-1, 2)$, and is congruent to the graph of $y = -x^2$. Reflect, in the x-axis, the part of the graph that is below the x-axis to get the graph of $y = |-(x + 1)^2 + 2|$.
From the graph, the domain of $y = |-(x + 1)^2 + 2|$ is $x \in \mathbb{R}$ and the range is $y \geq 0$.

16. Write each absolute value function in piecewise notation.

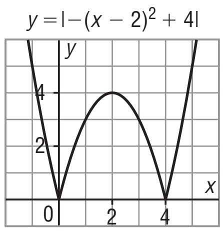
a)



The x-intercept is -2.
So, the graph of $y = |-2x - 4|$ is equal to the graph of $y = -2x - 4$ when $x \leq -2$.
And, the graph of $y = |-2x - 4|$ is equal to the graph of $y = 2x + 4$ when $x > -2$.
In piecewise notation:

$$y = \begin{cases} -2x - 4, & \text{if } x \leq -2 \\ 2x + 4, & \text{if } x > -2 \end{cases}$$

b)



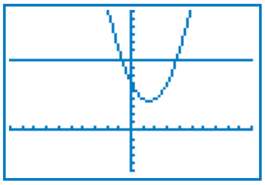
The x-intercepts are 0 and 4.
So, the graph of $y = |-(x - 2)^2 + 4|$ is equal to the graph of $y = -(x - 2)^2 + 4$ for $0 \leq x \leq 4$.
And, the graph of $y = |-(x - 2)^2 + 4|$ is equal to the graph of $y = (x - 2)^2 - 4$ for $x < 0$ or $x > 4$.
In piecewise notation:

$$y = \begin{cases} -(x - 2)^2 + 4, & \text{if } 0 \leq x \leq 4 \\ (x - 2)^2 - 4, & \text{if } x < 0 \text{ or } x > 4 \end{cases}$$

17. Solve by graphing. Give the solutions to the nearest tenth.

$|-x^2 + 3x - 6| = 9$

Use a graphing calculator.



From the graph, the solutions are: $x \doteq -0.8$ and $x \doteq 3.8$
(The solutions can be verified using a calculator.)

18. Use algebra to solve each equation.

a) $2|2x - 1| = 9 - x$ **Divide by 2.**

$|2x - 1| = 4.5 - 0.5x$

Write 2 equations.

If $2x - 1 \geq 0$, then $x \geq 0.5$, and
$2x - 1 = 4.5 - 0.5x$
$2.5x = 5.5$
$x = 2.2$

If $2x - 1 < 0$, then $x < 0.5$, and
$-(2x - 1) = 4.5 - 0.5x$
$1.5x = -3.5$
$x = -2.\overline{3}$

The solutions are: $x = 2.2$ and $x = -2.\overline{3}$
(The solutions can be verified using mental math.)

b) $|x^2 - 7x + 6| = 4$

Write 2 equations.

If $x^2 - 7x + 6 \geq 0$
Then, $x^2 - 7x + 6 = 4$
$x^2 - 7x + 2 = 0$

Use: $x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

Substitute:
$a = 1, b = -7, c = 2$

$x = \dfrac{7 \pm \sqrt{(-7)^2 - 4(1)(2)}}{2(1)}$

$x = \dfrac{7 \pm \sqrt{41}}{2}$

(The solutions can be verified using a calculator.)

If $x^2 - 7x + 6 < 0$
Then, $-(x^2 - 7x + 6) = 4$
$x^2 - 7x + 10 = 0$
$(x - 2)(x - 5) = 0$
$x = 2$ or $x = 5$
Verify using mental math.

Both roots are solutions.

The solutions are: $x = \dfrac{7 \pm \sqrt{41}}{2}$, $x = 2$, and $x = 5$

19. Graph each pair of functions on the same grid. State the equations of the asymptotes, the domain, and the range of each reciprocal function.

a) $y = 2x - 3$ and $y = \frac{1}{2x - 3}$

b) $y = -x + 2$ and $y = \frac{1}{-x + 2}$

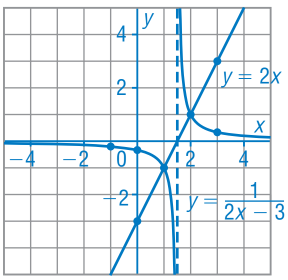
a) The graph of $y = 2x - 3$ has slope 2 and y-intercept -3.

The graph of $y = \frac{1}{2x - 3}$ has horizontal asymptote $y = 0$ and vertical asymptote $x = 1.5$.

Points $(1, -1)$ and $(2, 1)$ are common to both graphs.

Some points on $y = 2x - 3$ are $(0, -3)$, $(-1, -5)$, and $(3, 3)$.

So, points on $y = \frac{1}{2x - 3}$ are $(0, -0.\overline{3})$, $(-1, -0.2)$, and $(3, 0.\overline{3})$. From the graph, $y = \frac{1}{2x - 3}$ has domain $x \in \mathbb{R}$, $x \neq 1.5$; and range $y \in \mathbb{R}$, $y \neq 0$



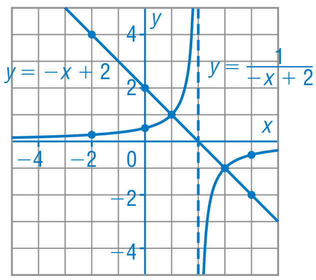
b) The graph of $y = -x + 2$ has slope -1 and y-intercept 2.

The graph of $y = \frac{1}{-x + 2}$ has horizontal asymptote $y = 0$ and vertical asymptote $x = 2$.

Points $(1, 1)$ and $(3, -1)$ are common to both graphs.

Some points on $y = -x + 2$ are $(0, 2)$, $(-2, 4)$, and $(4, -2)$.

So, points on $y = \frac{1}{-x + 2}$ are $(0, 0.5)$, $(-2, 0.25)$, and $(4, -0.5)$. From the graph, $y = \frac{1}{-x + 2}$ has domain $x \in \mathbb{R}$, $x \neq 2$; and range $y \in \mathbb{R}$, $y \neq 0$



20. Determine the equations of the vertical asymptotes of the graph of the reciprocal function $y = \frac{1}{(x + 3)^2 - 4}$.

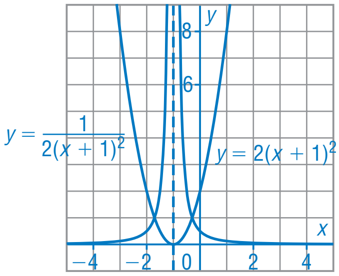
Vertical asymptotes occur for values of x where y is undefined; that is, when

$$(x + 3)^2 - 4 = 0$$
$$(x + 3)^2 = 4$$
$$x + 3 = \pm 2$$
$$x = -1 \text{ or } x = -5$$

The equations of the vertical asymptotes are $x = -1$ and $x = -5$.

21. Graph these functions on the same grid:

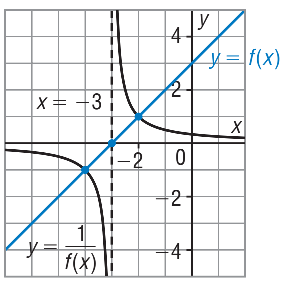
$y = 2(x + 1)^2$ and $y = \dfrac{1}{2(x + 1)^2}$



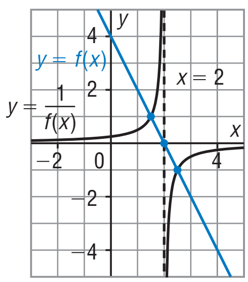
The graph of $y = 2(x + 1)^2$ opens up, has vertex $(-1, 0)$, and is congruent to $y = 2x^2$. The graph of $y = \dfrac{1}{2(x + 1)^2}$ has vertical asymptote $x = -1$ and horizontal asymptote $y = 0$. Plot points where the line $y = 1$ intersects the graph of $y = 2(x + 1)^2$. These points are common to both graphs. The graph of the reciprocal function has Shape 2.

22. Use each graph of the reciprocal function $y = \dfrac{1}{f(x)}$ to graph the linear function $y = f(x)$.

a)



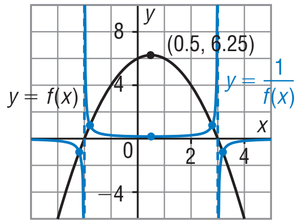
b)



Vertical asymptote is $x = -3$, so the graph of $y = f(x)$ has x-intercept -3. Mark points at $y = 1$ and $y = -1$ on the graph of $y = \dfrac{1}{f(x)}$, then draw a line through these points for the graph of $y = f(x)$.

Vertical asymptote is $x = 2$, so the graph of $y = f(x)$ has x-intercept 2. Mark points at $y = 1$ and $y = -1$ on the graph of $y = \dfrac{1}{f(x)}$, then draw a line through these points for the graph of $y = f(x)$.

23. Use the graph of the quadratic function $y = f(x)$ to sketch a graph of the reciprocal function $y = \frac{1}{f(x)}$. Identify any vertical asymptotes.



The graph of $y = f(x)$ has two x-intercepts, so the graph of $y = \frac{1}{f(x)}$ has 2 vertical asymptotes, $x = -2$ and $x = 3$, and has Shape 3. The horizontal asymptote is $y = 0$.

Plot points where the lines $y = 1$ and $y = -1$ intersect the graph of $y = f(x)$. These points are common to both graphs. The graph of $y = f(x)$ has vertex (0.5, 6.25), so point $\left(0.5, \frac{1}{6.25}\right)$, or (0.5, 0.16) lies on $y = \frac{1}{f(x)}$.