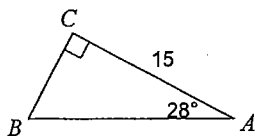


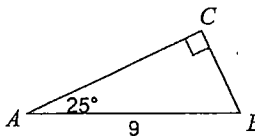
## Chapter 2 Review for Final Exam

Solve each triangle. Round answers to the nearest tenth.

1)



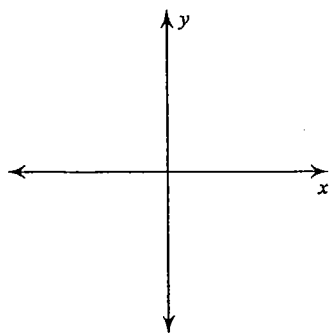
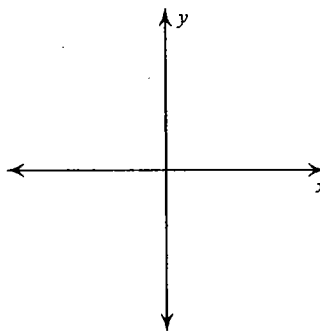
2)



State the quadrant in which the terminal side of each angle lies.

3)  $230^\circ$ 4)  $326^\circ$ 

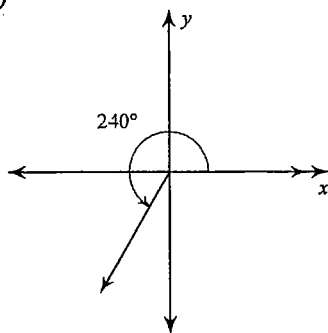
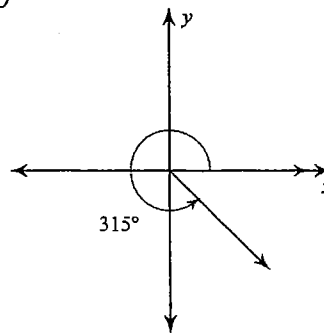
Draw an angle with the given measure in standard position.

5)  $185^\circ$ 6)  $320^\circ$ 

Find the reference angle.

7)  $135^\circ$ 8)  $275^\circ$ 9)  $320^\circ$ 10)  $170^\circ$ 

Find the exact value of each trigonometric function.

11)  $\cos \theta$ 12)  $\sin \theta$ 

13)  $\tan 225^\circ$

14)  $\sin 150^\circ$

Use the given point on the terminal side of angle  $\theta$  to find the value of the trigonometric function indicated.

15)  $\cos \theta; (-4, -2\sqrt{5})$

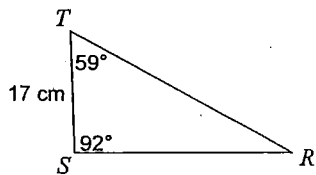
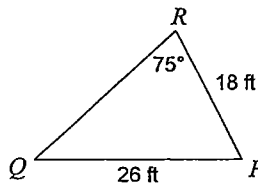
16)  $\tan \theta; (3, 5)$

17)  $\sin \theta; (2, 6)$

18)  $\cos \theta; (-\sqrt{7}, 3)$

Find each measurement indicated. Round your answers to the nearest tenth.

19) Find RS

20) Find  $m\angle Q$ 

21)  $m\angle A = 107^\circ$ ,  $m\angle C = 12^\circ$ ,  $c = 5$  m  
Find  $a$

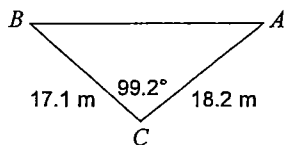
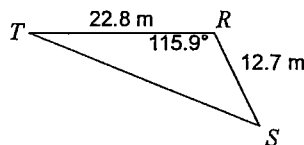
22) In  $\triangle RST$ ,  $m\angle R = 34^\circ$ ,  $t = 18$  mi,  $r = 19$  mi  
Find  $m\angle T$

State the number of possible triangles that can be formed using the given measurements.

23)  $m\angle A = 82^\circ$ ,  $c = 19$  mi,  $a = 9$  mi24)  $m\angle C = 65^\circ$ ,  $b = 35$  mi,  $c = 34$  mi25)  $m\angle A = 95^\circ$ ,  $a = 34$  in,  $c = 21$  in

Find each measurement indicated. Round your answers to the nearest tenth.

26) Find AB

27) Find  $m\angle S$ 

28) In  $\triangle PKH$ ,  $m\angle P = 137^\circ$ ,  $h = 18$  ft,  $k = 12$  ft  
Find  $p$

29) In  $\triangle CAB$ ,  $b = 14$  mi,  $a = 30$  mi,  $m\angle C = 29^\circ$   
Find  $m\angle A$

## Chapter 3 Review for Final Exam

Identify the vertex and axis of symmetry of each. Then sketch the graph.

1)  $y = (x - 1)^2 - 5$

2)  $y = -(x + 4)^2$

3)  $y = 2(x - 6)^2$

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

5)  $y = 3x^2 - 4$

Write each quadratic equation in vertex form by completing the square, and then sketch the graph of the equation.

6)  $y = x^2 - 6x + 7$

7)  $y = -x^2 - 6x - 6$

8)  $y = 2x^2 - 16x + 36$

9)  $y = \frac{1}{3}x^2 - 2x - 1$

10)  $y = -4x^2 - 24x - 33$

## Chapter 4 Review for Final Exam

**Factor each completely.**

1)  $x^2 + 9x + 20$

2)  $x^3 - 6x^2 - 27x$

3)  $p^2 + 3p - 40$

4)  $b^2 - 8b$

5)  $x^2 - 100$

6)  $2r^2 + r - 1$

7)  $6n^2 + 10n - 24$

8)  $5n^2 - 9n - 2$

9)  $35n^2 - 45n$

10)  $9n^2 - 64$

11)  $10v^2 + 41v - 18$

12)  $4k^2 - 9$

**Solve each equation by factoring.**

13)  $b(7b + 6) = 0$

14)  $(n - 4)(n - 5) = 0$

15)  $(r - 3)(r + 2) = 0$

16)  $k^2 - 10k + 16 = 0$

17)  $2v^2 + 16v + 32 = 0$

18)  $-60n = -180 - 5n^2$

19)  $2n^2 = 24n - 70$

20)  $7n^2 + 12n - 4 = 0$

21)  $5a^2 - 11a + 2 = 0$

22)  $3b^2 - 3b = 35 + 5b$

**Solve each equation with the quadratic formula.**

23)  $4x^2 + 3x - 115 = 0$

24)  $4x^2 + 12x - 7 = 0$

25)  $6b^2 - 11b - 81 = -9$

26)  $-2m^2 + 3m + 89 = 12$

27)  $2n^2 - 5n = 88$

28)  $-51 - x = -6x^2$

29)  $-95 + 10x = -4x^2 + 11x$

30)  $-6a^2 - 7a + 86 = -12$

## Chapter 5 Review for Final Exam

Simplify.

1)  $\sqrt{288}$

2)  $\sqrt[4]{128}$

3)  $8\sqrt{32}$

4)  $-4\sqrt{200}$

5)  $\sqrt[3]{625v}$

6)  $\sqrt{32m}$

7)  $-2\sqrt[3]{625x}$

8)  $4\sqrt{98m^3}$

9)  $\sqrt{512m^4n^4}$

10)  $2\sqrt[3]{448x^7y}$

11)  $\sqrt{175x^4y^2z^4}$

12)  $8\sqrt[3]{250m^6n^8p^3}$

13)  $-3\sqrt[3]{3} - \sqrt[3]{3}$

14)  $-3\sqrt{6} - 3\sqrt{2} - 3\sqrt{6}$

15)  $2\sqrt{45} + 3\sqrt{5}$

16)  $2\sqrt{3} - 3\sqrt{27}$

17)  $-\sqrt{5} + 2\sqrt{20} - \sqrt{24}$

18)  $2\sqrt{24} - 3\sqrt{45} + 3\sqrt{5}$

19)  $\sqrt{5} \cdot \sqrt{3}$

20)  $\sqrt{12} \cdot \sqrt{6}$

21)  $3\sqrt{3}(2\sqrt{5} + \sqrt{3})$

22)  $-5\sqrt{15}(4 + \sqrt{6})$

23)  $(-4\sqrt{5} + \sqrt{2})(\sqrt{5} + \sqrt{2})$

24)  $(-3 - 5\sqrt{2})(2 + \sqrt{2})$

25)  $\frac{\sqrt{2}}{\sqrt{32}}$

26)  $\frac{\sqrt{3} + \sqrt{2}}{\sqrt{9}}$

27)  $-\frac{1}{\sqrt{5}}$

28)  $\frac{4 - \sqrt{3}}{5\sqrt{7}}$

29)  $\frac{4}{-5 - 3\sqrt{2}}$

30)  $\frac{3}{2 - \sqrt{2}}$

31)  $\frac{\sqrt{3} + 5}{3 - \sqrt{3}}$

32)  $\frac{\sqrt{2} - \sqrt{3}}{2 - 4\sqrt{2}}$

Solve each equation. Remember to check for extraneous solutions.

33)  $-18 = -3\sqrt{v-6}$

34)  $4\sqrt{x+9} = 20$

35)  $\sqrt{12-x} = \sqrt{x}$

36)  $\sqrt{3x+14} = \sqrt{x+10}$

37)  $n = \sqrt{7n}$

38)  $x = \sqrt{-49 + 14x}$

39)  $b = 3 + \sqrt{7b-31}$

40)  $\sqrt{3v-23} = v-7$

41)  $\sqrt{3x-5} = 1 - \sqrt{3x+4}$

42)  $\sqrt{4a-3} = \sqrt{2a-5} + 2$

## Chapter 6 Review for Final Exam

Simplify each and state the excluded values.

1)  $-\frac{54a^5}{12a}$

2)  $\frac{12a^2}{20a}$

3)  $\frac{n+9}{n^2+17n+72}$

4)  $\frac{35n-42}{49}$

5)  $\frac{2k+8}{k^2-4k-32}$

6)  $\frac{6k-54}{9k-81}$

7)  $\frac{24n^2-80n}{40n^3-40n^2-80n}$

8)  $\frac{b^2-4b-21}{b^3-10b^2+21b}$

9)  $\frac{10m^2}{5m^2} \cdot \frac{2m}{4m}$

10)  $\frac{9p^2}{7p} \cdot \frac{9p}{8}$

11)  $\frac{5(n+8)}{n+6} \cdot \frac{(n+6)(n-2)}{4(n-2)}$

12)  $\frac{(n+7)(n+9)}{(n+9)(n+1)} \cdot \frac{(n+10)(n+1)}{n+10}$

13)  $\frac{4m+32}{3} \cdot \frac{m+2}{4}$

14)  $\frac{1}{x-4} \cdot \frac{10x+20}{10}$

15)  $\frac{54n}{n^2-11n+30} \cdot \frac{n^2-12n+35}{n-7}$

16)  $\frac{4a^2+28a}{a+7} \cdot \frac{10a-40}{4a^2+8a}$

17)  $\frac{10}{6} \div \frac{8}{10k}$

18)  $\frac{5}{9} \div \frac{3}{8v^2}$

19)  $\frac{(r-6)(r+8)}{10(r+8)} \div \frac{r-2}{(r-7)(r-2)}$

20)  $\frac{(x-7)(x-4)}{x-4} \div \frac{(x-7)(x-4)}{10}$

21) 
$$\frac{24 - 2k - k^2}{k + 6} \div \frac{k - 4}{10k}$$

22) 
$$(n + 10) \div \frac{6n^2 + 60n}{6n^2 - 36n}$$

23) 
$$\frac{n^2 + 13n + 42}{n^2 - 6n - 16} \div \frac{n^2 + 13n + 42}{3n}$$

24) 
$$\frac{9x - 9}{3x + 21} \div \frac{9x + 63}{x^2 + 14x + 49}$$

**Simplify each expression.**

25) 
$$\frac{x - y}{20yx} + \frac{x + 2y}{20yx}$$

26) 
$$\frac{5b - 3}{3(5b + 1)} - \frac{5}{3(5b + 1)}$$

27) 
$$\frac{4}{3v} + \frac{u + 6v}{2uv^2}$$

28) 
$$\frac{3m}{3} - \frac{6m}{4n^3}$$

29) 
$$\frac{m - 1}{m + 6} + \frac{6}{2}$$

30) 
$$\frac{6x}{3} - \frac{3x - 6}{4(x - 3)}$$

31) 
$$\frac{2m}{2} + \frac{3m}{10m + 4}$$

32) 
$$\frac{3}{a + 1} - \frac{a + 3}{3a}$$

**Solve each equation. Remember to check for extraneous solutions.**

33) 
$$\frac{6}{k^2} = \frac{1}{k^2} + \frac{1}{k}$$

34) 
$$\frac{1}{2} - \frac{3}{a} = \frac{a + 5}{a}$$

35) 
$$\frac{3}{x} = \frac{1}{x + 3} - \frac{1}{x^2 + 3x}$$

36) 
$$\frac{4}{r + 2} = \frac{2}{r + 5} + \frac{1}{r + 5}$$

37) 
$$\frac{1}{3v^2} + \frac{5v - 4}{3v} = \frac{v + 1}{3v}$$

38) 
$$\frac{1}{2n^3} = \frac{3n - 9}{4n^2} + \frac{n^2 - 10n + 24}{4n^3}$$

39) 
$$1 = \frac{v}{v - 1} + \frac{v + 5}{3v^2 - 3v}$$

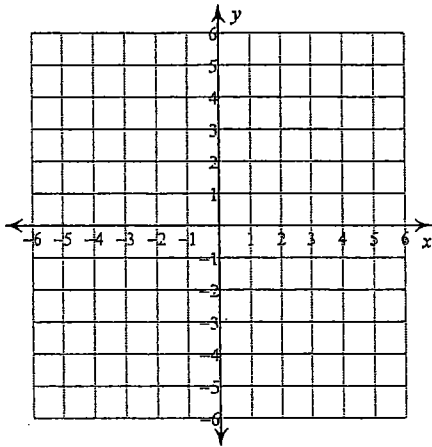
40) 
$$\frac{4}{6n - 5} = \frac{1}{6n - 5} - (n + 1)$$



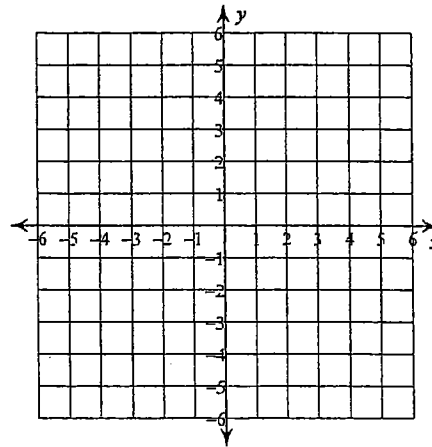
## Chapter 7 Review for Final Exam

Graph each equation.

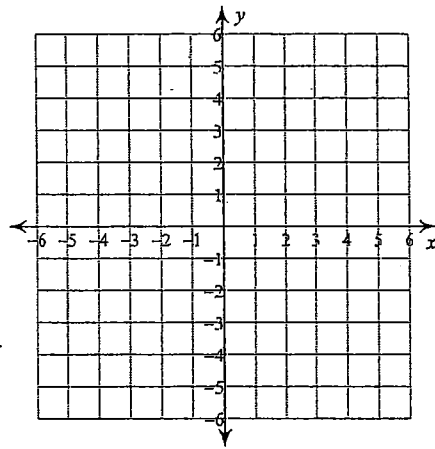
1)  $y = |-2x - 3|$



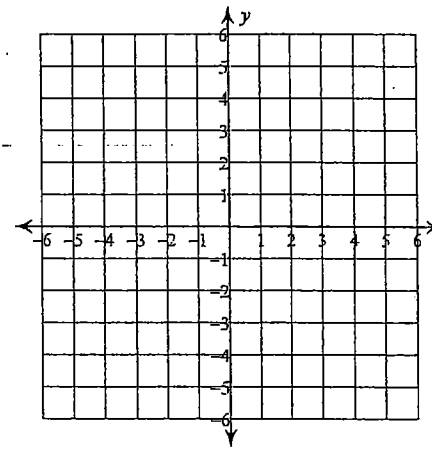
2)  $y = |2x + 2|$



3)  $y = |-3x - 1|$



4)  $y = |3x - 3|$



Solve each equation.

5)  $\frac{|n|}{9} = -3$

6)  $6|x| - 9 = 3$

7)  $|n + 5| = 3$

8)  $|n - 8| + 10 = 16$

9)  $9 - 6|-5b| = 69$

10)  $|4 - 6v| = 2$

11)  $|-9 - 3n| + 1 = 10$

12)  $9|4 + 2n| + 2 = 56$

## Reciprocal Graphs

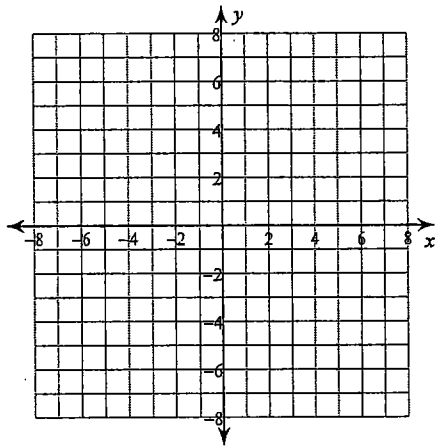
Graph the reciprocal linear functions.

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

Determine the:

equation of the asymptote

the invariant points

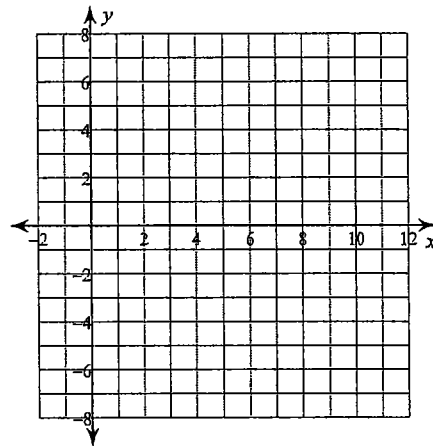


$$2) y = \frac{1}{-\frac{3}{5}x + 4}$$

Determine the:

equation of the asymptote

the invariant points

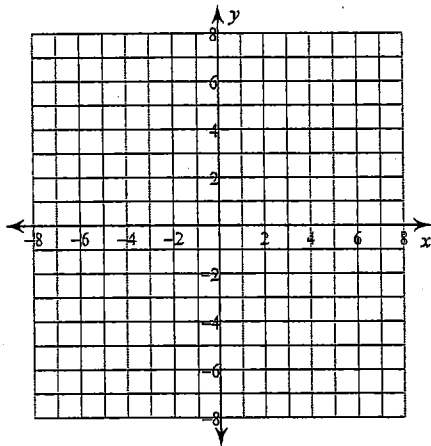


$$3) y = \frac{1}{(x-1)^2 - 4}$$

Determine the:

equations of the asymptotes

invariant points

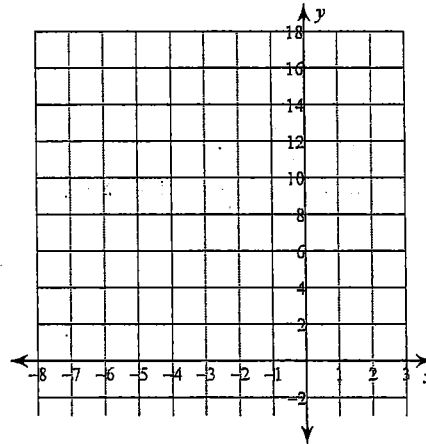


$$4) y = \frac{1}{4x^2 + 24x + 36}$$

Determine the:

equations of the asymptotes

invariant points



## Chapter 9 Review for Final Exam

Solve each inequality and graph its solution.

1)  $b - 2 - 2b < 5$

2)  $6p + 4p < 0$

3)  $8 + 3b < 15 + 4b$

4)  $1 - k < -3k + 1$

5)  $-84 < 3(5a - 4) - 6a$

6)  $-413 \leq -7(7x + 3)$

7)  $-2(5x - 4) \leq -20 - 6x$

8)  $7k - 21 < 7(k - 3)$

9)  $-4(8 - 7r) - 3(-r - 4) < -20$

10)  $-7(3 - b) + 6(-6 - 8b) \leq 25$

11)  $-4 + 2(3r - 6) < -2(1 + r) - 6$

12)  $-2(-6x + 2) \leq -4(3 - x)$

**Solve each inequality.**

13)  $3x - 9 < 0$

14)  $2x - 10 \geq 3x + 10$

15)  $5(x - 2) > 3x + 4$

16)  $3x + 5 - 4x - 7 \leq -2(4 - x) + 1$

17)  $-x^2 + 4x < -5$

18)  $2x^2 + 10x + 12 \leq 0$

19)  $2x^2 + 10x + 12 \leq 0$

20)  $x^2 < -3x - 2$

21)  $4x^2 - 7x < -3$

22)  $6x^2 - 1 \geq x$

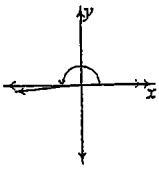
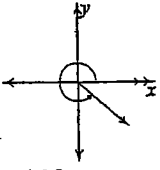
23)  $2x^2 - 28x + 98 > 0$

24)  $2x^2 > 7x + 4$

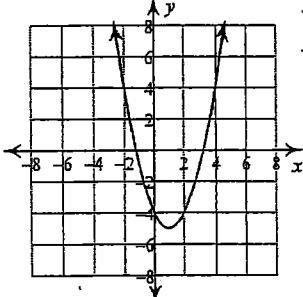
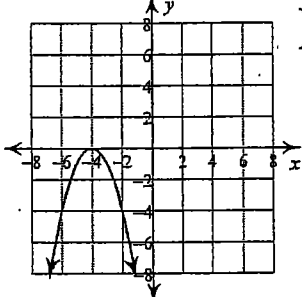
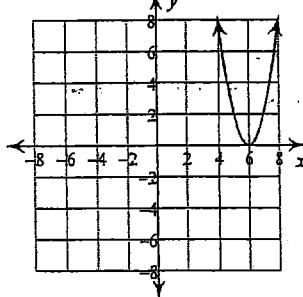
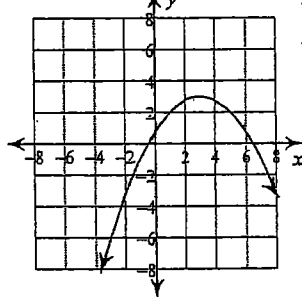
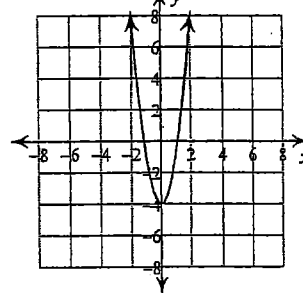
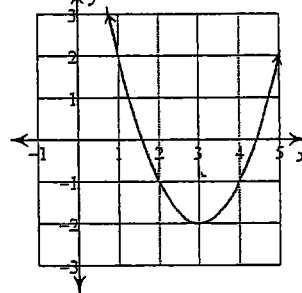
25)  $-x^2 - 10x - 25 \leq 0$

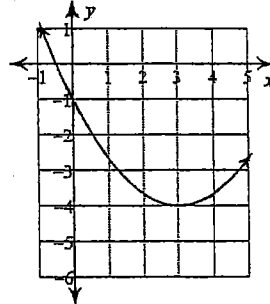
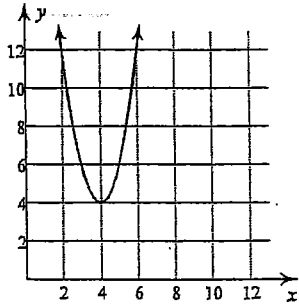
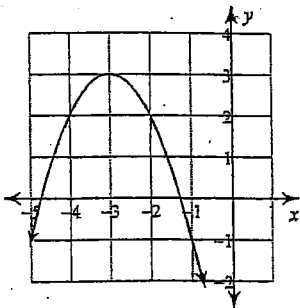
26)  $x^2 + 3 \geq 3x^2 + 3x$

## Answers to Chapter 2 Review for Final Exam

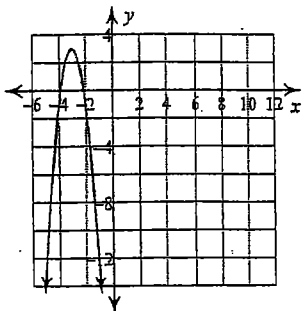
- |  |  |   |
|--|--|---|
| 1) $m\angle B = 62^\circ$ , $a = 8$ , $c = 17$ | 2) $m\angle B = 65^\circ$ , $a = 3.8$ , $b = 8.2$                                    | 3) III  |
| 4) IV  | 5)  | 6)  |
| 8) $85^\circ$                                  | 9) $40^\circ$  | 10) $10^\circ$  |
| 12) $-\frac{\sqrt{2}}{2}$                      | 13) 1  | 14) $\frac{1}{2}$   |
| 16) $\frac{5}{3}$                              | 17) $\frac{3\sqrt{10}}{10}$  | 18) $-\frac{\sqrt{7}}{4}$   |
| 20) $42^\circ$                                 | 21) 23 m   | 22) $32^\circ$  |
| 24) Two triangles                              | 25) One triangle   | 26) 26.9 m  |
| 28) 28 ft                                      | 29) $130.1^\circ$  | 7) $45^\circ$   |
|  |  | 11) $-\frac{1}{2}$  |
|  |  | 15) $-\frac{2}{3}$  |
|  |  | 19) 30.1 cm   |
|  |  | 23) None  |
|  |  | 27) $42.2^\circ$  |

## Answers to Chapter 3 Review for Final Exam

- |  |   |
|--|---|
| <p>1)  Vertex: (1, -5)<br/>Axis of Sym.: <math>x = 1</math></p>  | <p>2)  Vertex: (-4, 0)<br/>Axis of Sym.: <math>x = -4</math></p> |
| <p>3)  Vertex: (6, 0)<br/>Axis of Sym.: <math>x = 6</math></p>  | <p>4)  Vertex: (3, 3)<br/>Axis of Sym.: <math>x = 3</math></p>  |
| <p>5)  Vertex: (0, -4)<br/>Axis of Sym.: <math>x = 0</math></p> | <p>6) </p>  |



10)



### Answers to Chapter 4 Review for Final Exam

- |                                      |                                      |                    |                                      |
|--------------------------------------|--------------------------------------|--------------------|--------------------------------------|
| 1) $(x+5)(x+4)$                      | 2) $x(x+3)(x-9)$                     | 3) $(p-5)(p+8)$    | 4) $b(b-8)$                          |
| 5) $(x+10)(x-10)$                    | 6) $(2r-1)(r+1)$                     | 7) $2(3n-4)(n+3)$  | 8) $(5n+1)(n-2)$                     |
| 9) $5n(7n-9)$                        | 10) $(3n+8)(3n-8)$                   | 11) $(2v+9)(5v-2)$ | 12) $(2k+3)(2k-3)$                   |
| 13) $\left\{-\frac{6}{7}, 0\right\}$ | 14) $\{4, 5\}$                       | 15) $\{3, -2\}$    | 16) $\{8, 2\}$                       |
| 17) $\{-4\}$                         | 18) $\{6\}$                          | 19) $\{5, 7\}$     | 20) $\left\{\frac{2}{7}, -2\right\}$ |
| 21) $\left\{\frac{1}{5}, 2\right\}$  | 22) $\left\{-\frac{7}{3}, 5\right\}$ | 23) $\{5, -5.75\}$ | 24) $\{0.5, -3.5\}$                  |
| 25) $\{4.5, -2.667\}$                | 26) $\{-5.5, 7\}$                    | 27) $\{8, -5.5\}$  | 28) $\{3, -2.833\}$                  |
| 29) $\{5, -4.75\}$                   | 30) $\{-4.667, 3.5\}$                |                    |                                      |

### Answers to Chapter 5 Review for Final Exam

- |   |                                |                                   |                               |
|---|--------------------------------|-----------------------------------|-------------------------------|
| 1) $12\sqrt{2}$                                 | 2) $2\sqrt[4]{8}$              | 3) $32\sqrt{2}$                   | 4) $-40\sqrt{2}$              |
| 5) $5\sqrt[3]{5v}$                              | 6) $4\sqrt{2m}$                | 7) $-10\sqrt[3]{5x}$              | 8) $28m\sqrt{2m}$             |
| 9) $16m^2n^2\sqrt{2}$                           | 10) $8x^2\sqrt[3]{7xy}$        | 11) $5x^2z^2y\sqrt{7}$            | 12) $40m^2n^2p\sqrt[3]{2n^2}$ |
| 13) $-4\sqrt[3]{3}$                             | 14) $-6\sqrt{6}-3\sqrt{2}$     | 15) $9\sqrt{5}$                   | 16) $-7\sqrt{3}$              |
| 17) $3\sqrt{5}-2\sqrt{6}$                       | 18) $4\sqrt{6}-6\sqrt{5}$      | 19) $\sqrt{15}$                   | 20) $6\sqrt{2}$               |
| 21) $6\sqrt{15}+9$                              | 22) $-20\sqrt{15}-15\sqrt{10}$ | 23) $-18-3\sqrt{10}$              | 27) $-\frac{\sqrt{5}}{5}$     |
| 24) $-16-13\sqrt{2}$                            | 25) $\frac{1}{4}$              | 26) $\frac{\sqrt{3}+\sqrt{2}}{3}$ | 31) $\frac{4\sqrt{3}+9}{3}$   |
| 28) $\frac{4\sqrt{7}-\sqrt{21}}{35}$            | 29) $\frac{-20+12\sqrt{2}}{7}$ | 30) $\frac{6+3\sqrt{2}}{2}$       | 34) $\{16\}$                  |
| 32) $\frac{-\sqrt{2}-4+\sqrt{3}+2\sqrt{6}}{14}$ | 33) $\{42\}$                   |                                   |                               |
| 35) $\{6\}$                                     | 36) $\{-2\}$                   | 37) $\{0, 7\}$                    | 38) $\{7\}$                   |
| 39) $\{8, 5\}$                                  | 40) $\{9, 8\}$                 | 41) No solution.                  | 42) $\{7, 3\}$                |

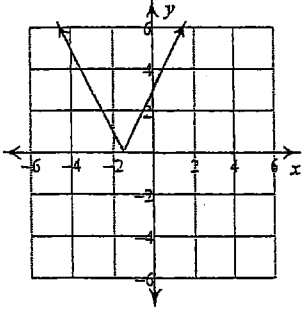
## Answers to Chapter 6 Review for Final Exam

- 1)  $-\frac{9a^4}{2}; \{0\}$       2)  $\frac{3a}{5}; \{0\}$       3)  $\frac{1}{n+8}; \{-9, -8\}$   
 4)  $\frac{5n-6}{7};$  No excluded values.      5)  $\frac{2}{k-8}; \{8, -4\}$       6)  $\frac{2}{3}; \{9\}$   
 7)  $\frac{3n-10}{5(n-2)(n+1)}; \{0, 2, -1\}$       8)  $\frac{b+3}{b(b-3)}; \{0, 7, 3\}$       9)  $1; \{0\}$   
 10)  $\frac{81p^2}{56}; \{0\}$       11)  $\frac{5(n+8)}{4}; \{-6, 2\}$       12)  $n+7; \{-9, -1, -10\}$   
 13)  $\frac{(m+8)(m+2)}{3};$  None      14)  $\frac{x+2}{x-4}; \{4\}$       15)  $\frac{54n}{n-6}; \{6, 5, 7\}$   
 16)  $\frac{10(a-4)}{a+2}; \{-7, 0, -2\}$       17)  $\frac{25k}{12}; \{0\}$       18)  $\frac{40v^2}{27}; \{0\}$   
 19)  $\frac{(r-6)(r-7)}{10}; \{-8, 7, 2\}$       20)  $\frac{10}{x-4}; \{4, 7\}$       21)  $-10k; \{-6, 0, 4\}$   
 22)  $n-6; \{0, 6, -10\}$       23)  $\frac{3n}{(n-8)(n+2)}; \{8, -2, 0, -7, -6\}$       24)  $\frac{x-1}{3}; \{-7\}$   
 25)  $\frac{2x+y}{20yx}$       26)  $\frac{5b-8}{15b+3}$       27)  $\frac{8uv+3u+18v}{6v^2u}$       28)  $\frac{2mn^3-3m}{2n^3}$   
 29)  $\frac{4m+17}{m+6}$       30)  $\frac{8x^2-27x+6}{4(x-3)}$       31)  $\frac{10m^2+7m}{2(5m+2)}$       32)  $\frac{5a-a^2-3}{3a(a+1)}$   
 33)  $\{5\}$       34)  $\{-16\}$       35)  $\{-5\}$       36)  $\{-14\}$   
 37)  $\left\{1, \frac{1}{4}\right\}$       38)  $\left\{2, \frac{11}{4}\right\}$       39)  $\left\{-\frac{5}{4}\right\}$       40)  $\left\{\frac{1}{2}, -\frac{2}{3}\right\}$

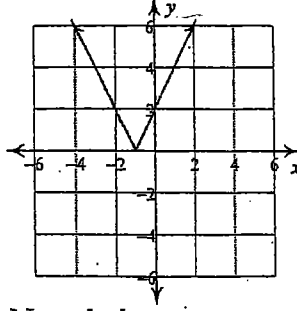


## Answers to Chapter 7 Review for Final Exam

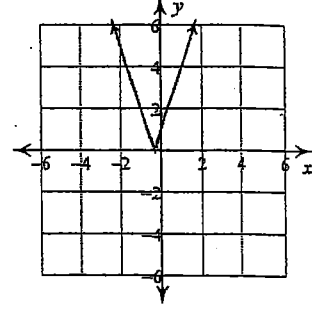
1)



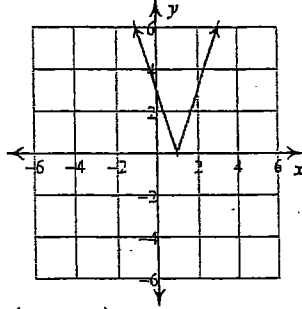
2)



3)



4)



5) No solution.

6)  $\{2, -2\}$

7)  $\{-2, -8\}$

8)  $\{14, 2\}$

9) No solution

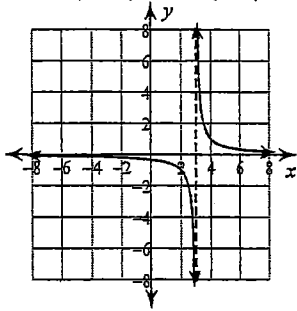
10)  $\left\{\frac{1}{3}, 1\right\}$

11)  $\{-6, 0\}$

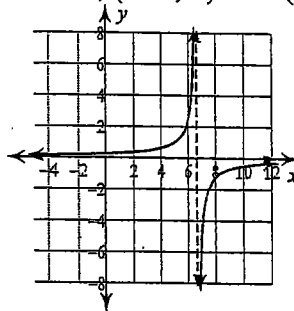
12)  $\{1, -5\}$

## Answers to Reciprocal Graphs

1)  $x=3$ ,  $(2, -1)$  and  $(4, 1)$



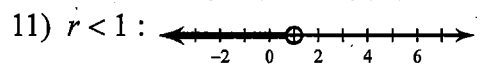
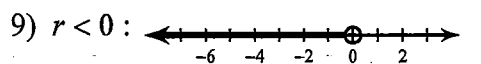
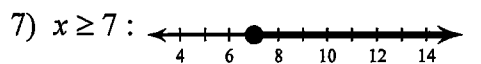
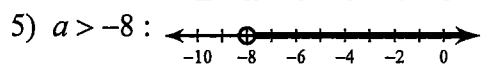
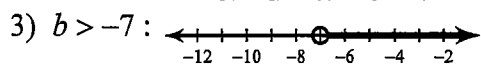
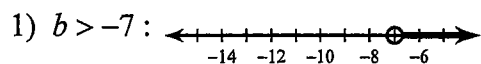
2)  $x=6.67$ ,  $(8.33, -1)$  and  $(5, 1)$



3)  $x=-1$ ,  $x=3$ ,  $(-0.732, -1)$  &  $(2.732, -1)$  and  $(-1.234, 1)$  &  $(3.236, 1)$

4)  $x=-3$ ,  $(-3.5, 1)$  &  $(-2.5, 1)$

## Answers to Chapter 9 Review for Final Exam



13)  $x < 3$

14)  $x \leq -20$

17)  $x \leq -1, x \geq 5$

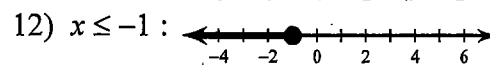
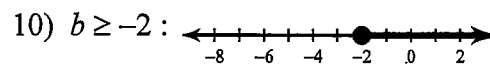
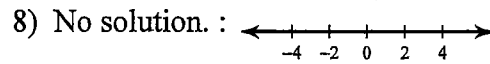
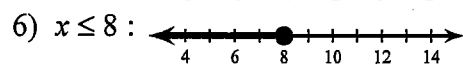
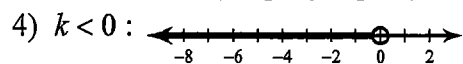
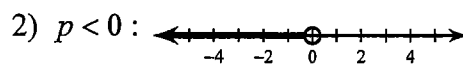
18)  $-3 \leq x \leq -2$

21)  $\frac{3}{4} < x < 1$

22)  $x \leq -\frac{1}{3}, x \geq \frac{1}{2}$

25) all real numbers

26)  $-2.19 \leq x \leq 0.69$



15)  $x > 7$

16)  $x \geq \frac{5}{3}$

19) no solution

20)  $-2 < x < -1$

23)  $x \neq 7$

24)  $x < -\frac{1}{2}, x > 4$