Answer Key

Algebra 2

An Incremental Development

THIRD EDITION

SAXON

Algebra 2: An Incremental Development
Third Edition

Answer Key

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Answer Key

for

Algebra 2

Third Edition

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Answers

problem set A

1. 115 **2.** 50 **3.** $x = 91$; $y = 89$; $p = 91$ **4.** $x = 40$; $y = 25$; $z = 80$ **5.** 140°
6. 50° **7.** 0 **8.** –5 **9.** 0 **10.** –11 **11.** –10 **12.** –21 **13.** 5 **14.** –30
15. 4 **16.** –13 **17.** –16 **18.** –45 **19.** –66 **20.** –12 **21.** 0 **22.** –13
23. 35 **24.** –24 **25.** 11 **26.** $-\frac{5}{6}$ **27.** –10 **28.** $\frac{13}{7}$ **29.** 192 **30.** –98

problem set B

1. 13.76 m^2 **2.** 21 m^2 **3.** 136.96 cm^2 **4.** 20.28 m **5.** 8.72 m^2 **6.** 40 cm^3
7. 18.28 m^2; 146.24 m^3 **8.** 904.32 cm^3; 452.16 cm^2 **9.** 62.8 cm^2 **10.** 32.56 yd
11. $x = 35$; $y = 110$; $z = 110$ **12.** 10 **13.** 20 **14.** 80° **15.** 120° **16.** –18
17. –4 **18.** –15 **19.** 23 **20.** –13 **21.** 26 **22.** –23 **23.** –16 **24.** –7
25. –11 **26.** –1 **27.** 6 **28.** $-\frac{3}{7}$ **29.** 0 **30.** 19

practice

a. $m\angle C = 35°$; $m\angle B = 110°$ **b.** $x = 35$; $y = 105$
c. $A = 50$; $B = 65$; $C = 50$ **d.** $\frac{8}{3}$

problem set 1

1. $x = 45$; $y = 90$ **2.** $x = 55$; $y = 70$ **3.** $A = 70$; $B = 110$; $C = 55$ **4.** $\frac{9}{2}$
5. 17.49 cm^2 **6.** 77.5 cm^2 **7.** 60.56 ft
8. $V_{Cylinder} \approx 401.92\ ft^3$; $V_{Sphere} \approx 267.95\ ft^3$ **9.** $x = 30$; $y = 30$; $p = 150$
10. $x = 6$; $y = 30$; $p = 120$ **11.** 73° **12.** 102.97 m^3 **13.** $16r^2$ **14.** –15
15. –100 **16.** 52 **17.** –35 **18.** 36 **19.** 87 **20.** –17 **21.** 46 **22.** –34
23. –87 **24.** 6 **25.** –69 **26.** –12 **27.** $-\frac{6}{13}$ **28.** –214 **29.** –15 **30.** 216

practice

a. $-\frac{1}{16}$ **b.** $-\frac{1}{16}$ **c.** $x^{-1}y^4$ **d.** 14π cm

problem set 2

1. $\frac{9}{2}$ **2.** $x = 38$; $y = 104$ **3.** 178.99 m^3 **4.** $A = 20$; $B = 50$; $C = 40$
5. $A = 120$; $B = 30$; $C = 40$ **6.** $s = 4$ cm; $r = 1$ cm; $A = 3.14\ cm^2$ **7.** 10 cm
8. 8.76 m^3 **9.** x^6y^{-12} **10.** m^9p^{-3} **11.** $x^{-1}y^7$ **12.** ab^6 **13.** $\frac{m^5y^3}{x^2}$ **14.** $\frac{1}{c^7d^6}$
15. mn^4 **16.** $\frac{y^{19}}{x^5}$ **17.** $\frac{c^3}{b^6}$ **18.** $b^{-3}c^{-3}$ **19.** $\frac{k^{-2}}{L^{-3}}$ **20.** $\frac{1}{s^{-1}t^{-5}y^{-1}}$ **21.** $\frac{x^{-3}z^{-12}}{y^{-1}}$
22. $\frac{1}{x^{-3}y^{-6}}$ **23.** $-\frac{1}{9}$ **24.** –8 **25.** –5 **26.** –8 **27.** –38 **28.** –12 **29.** –27
30. –9

practice

a. 21 **b.** –9 **c.** $\frac{a^3m}{x} - \frac{3x}{a^3m}$

problem set 3

1. $x = \frac{15}{2}$; $y = 33$; $z = 9$ **2.** 25.12 m **3.** $A = 40$; $B = 100$ **4.** 110.28 cm^3
5. 54 cm **6.** –26 **7.** –23 **8.** 72 **9.** 895 **10.** –24 **11.** 2677 **12.** 1
13. $5p^4x^4m^5 - \frac{2p^2x^4}{m^5}$ **14.** $\frac{m^4x^5}{k^5} - \frac{3m^7}{xk^2}$ **15.** $x^5y^4 + 4xy$ **16.** $2ym^2 - xy^2m$
17. $x^8y^{-8}p^6$ **18.** $m^4x^5y^{10}p^2$ **19.** $x^{-7}m^{-7}p^2$ **20.** $p^2x^{-10}k^3$ **21.** x^3 **22.** $x^{-8}y^{16}p^{-2}$
23. $x^{-2}y^{12}$ **24.** $7\frac{8}{9}$ **25.** –1 **26.** –15 **27.** –1 **28.** 18 **29.** 100 **30.** –12

practice a. $\frac{4b^2}{a^3x^2} - \frac{2b^4}{a^5c}$ b. $\frac{9}{13}$

problem set 4

1. Radius of r cm: $A = \pi r^2$ cm^2; Radius of $2r$ cm: $A = 4\pi r^2$cm^2
2. $x = 39$; $y = \frac{21}{4}$; $z = 17$ 3. $x = y = 40$; $P = 140$; $Q = R = 20$
4. $A_{\text{Square}} = 36$ cm^2; $R = 1$ cm; $A_{\text{Shaded}} \approx 7.74$ cm^2 5. 2.09 6. $\frac{2}{3}$ 7. $\frac{1}{20}$ 8. $-\frac{16}{9}$
9. -3 10. $\frac{9}{10}$ 11. $-\frac{1145}{168}$ 12. $x^4 - 3$ 13. $y^{-6}p^{-3} - 3y^{-3}p$ 14. $9x^{-1}y^4$
15. $\frac{x^4y^2}{4}$ 16. $2x^2y^{-2}$ 17. $\frac{x^{-8}y^{-3}}{4}$ 18. $12x^3y^4$ 19. $6x^2y^2$ 20. $2yx^{-1} - 4xy^{-1}$
21. $7ay^2x^{-1} + 2xya^{-1}$ 22. 16 23. -18 24. 2 25. -89 26. -1 27. 48
28. -19 29. 4 30. $-3\frac{7}{8}$

practice a. -25 b. 1015 pieces

problem set 5

1. -14 2. 24 ducks 3. -6 4. 96 clowns 5. 40,000 horde members
6. $H = 9$ in.; $AQ = 3$ in.; area$\Delta = 3$ in.^{2} 7. $x = 76$; $y = 52$
8. $C = 180$; $D = K = Q = x = 70$; $P = 110$ 9. 8 in.; 200.96 in.^{2}; 1004.8 in.^{3} 10. $\frac{9}{8}$
11. $-\frac{13}{6}$ 12. $-\frac{19}{28}$ 13. -6 14. $\frac{41}{15}$ 15. 6 16. $\frac{71}{14}$ 17. $2 - \frac{6a^2}{c}$
18. $-x^5 + \frac{3a^2x^3}{b}$ 19. $4x^{-1}$ 20. c^4d^3 21. $\frac{m^2}{8p^3}$ 22. $-2x^3y^3 + 7x^3y^{-3}$
23. $2a^2x - 8a^2x^3$ 24. 2 25. $\frac{7}{16}$ 26. $-\frac{9}{16}$ 27. 10 28. $18\frac{1}{4}$ 29. -35 30. 6

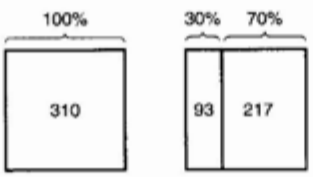
practice a. 28,507 stars b. 12, 14, 16

problem set 6

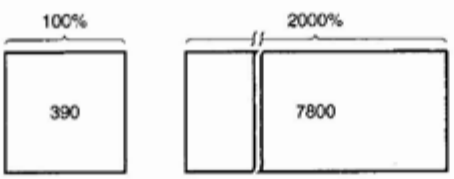
1. 30,000 teachers 2. 1041 statements 3. -3 4. 70 barge workers 5. 5, 7, 9
6. 12, 13, 14, 15 7. $\frac{\sqrt{46}}{2}$ cm 8. $A = B = 34$; $K = 146$; $M = 17$
9. $x = \frac{55}{6}$; $A = 25$; $B = \frac{130}{3}$ 10. 120° 11. 290 12. $\frac{365}{204}$ 13. 5 14. $\frac{31}{4}$
15. 28 16. $-3p^{-2} + 2x^2$ 17. $-kx^{-1} + 2k$ 18. $\frac{y^3}{4x}$ 19. $a^{-5}b^{-3}c^{-1}$ 20. $\frac{1}{16x^{12}y^2}$
21. $3xy - 5x$ 22. $-3x^3y^{-2} - x^3y^2$ 23. 28 24. $\frac{5}{8}$ 25. $-\frac{9}{8000}$ 26. 1 27. 6
28. -20 29. $14\frac{8}{9}$ 30. $-2\frac{71}{72}$

practice

a. 310



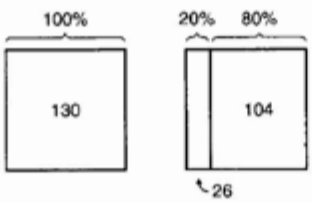
b. 2000%



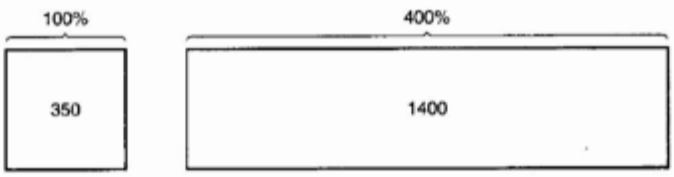
c. $x = 11$; $A = B = 34$

problem set 7

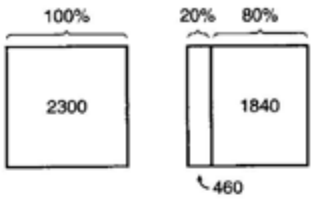
1. 130



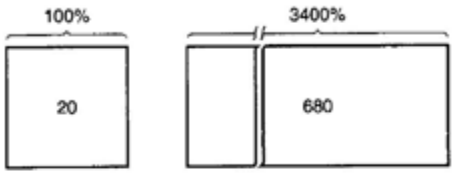
2. 400%



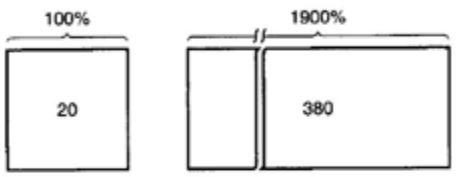
3. 2300



4. 3400%



5. 20



6. $-7, -5, -3$ **7.** 2, 4, 6

8. 5 **9.** 15 **10.** 20

11. $m\angle a = 15°$; $m\angle b = 45°$; $m\angle c = 90°$; $m\angle d = 30°$

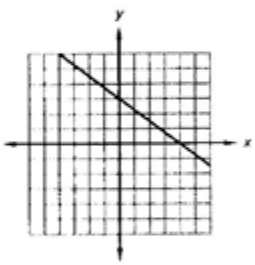
12. 180° **13.** $-\frac{1}{18}$ **14.** -4.88

15. $-\frac{47}{100}$ **16.** $-\frac{13}{7}$ **17.** $2 - 6x^2yp^{-1}$ **18.** $8 - 12x^{-1}y^2k^{-2}$ **19.** $2x^2y^{-10}$

20. $4x^{-6}y^9$ **21.** $2x^3yp^{-1}$ **22.** $-6xp^2 + 3p^2$ **23.** $-\frac{5}{12}$ **24.** $-\frac{1}{16}$ **25.** 16

26. $2\frac{1}{4}$ **27.** -50 **28.** 7 **29.** 38 **30.** -4

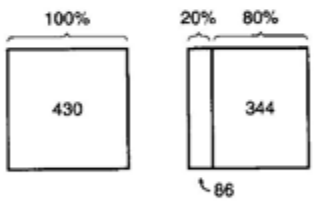
practice



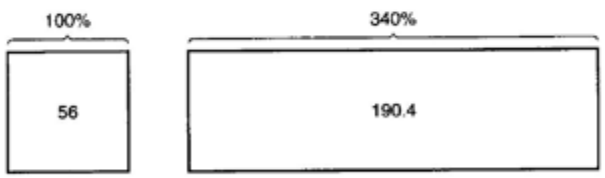
problem set 8

1. 2300 knights **2.** 18, 20, 22, 24 **3.** -13 **4.** 960 warriors **5.** 7, 9, 11

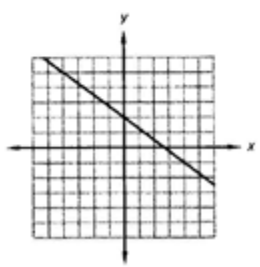
6. 430



7. 190.4



8. 61° **9.**



10. 19 **11.** $r = BD = AC = 5$ m **12.** 25

13. $x = 20$; $y = 105$ **14.** 9 **15.** $\frac{87}{35}$

16. $\frac{3}{2}$ **17.** $\frac{151}{56}$ **18.** $-3 - 4x^{-1}y^3p^{-3}$

19. $3x - 5p^2xy$ **20.** $2x^{-4}$ **21.** $20x^{-12}y^{-8}$

22. $5x^2y^{-1}$ **23.** $4xy^{-3} - 7xy$ **24.** $-\frac{3}{12}$

25. $\frac{1}{27}$ **26.** $\frac{2}{9}$ **27.** 24 **28.** 2

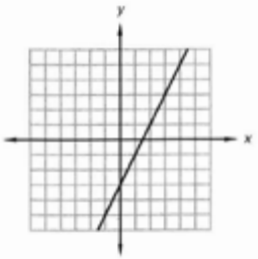
29. $-1\frac{1}{2}$ **30.** -2

practice a. 500 people b. 70,000 widgets

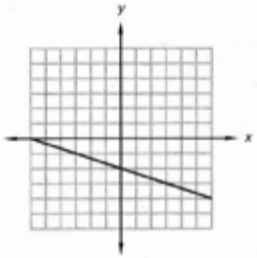
problem set 9

1. 240 wood nymphs 2. 97,100 bushels 3. \$97,500 4. 3, 4, 5 5. 250,000 soldiers
6. 11,200 Trojans 7. $m = 50$; $p = 70$ 8. $x = 10$; $y = 40$
9. $x = 10$; $5x + 10 = 60$; $y = 59$; $z = 120$ 10. $r = 3$ m; $C = 6\pi$ m

11.



12.

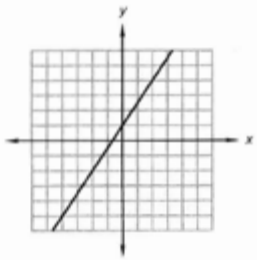


13. 5 14. $\frac{259}{288}$ 15. $\frac{6}{5}$ 16. 0 17. 0 18. $2k^2 - 3a^4k^{-1}$ 19. $\frac{a^2}{8x^8y^2}$
20. $-\frac{x^3}{8y^3z^{12}}$ 21. $7x - 2xy$ 22. $5xyp^{-1} - 5xy$ 23. $\frac{7}{16}$ 24. $\frac{9}{32}$ 25. –90
26. 112 27. 14 28. –15 29. 8 30. 7

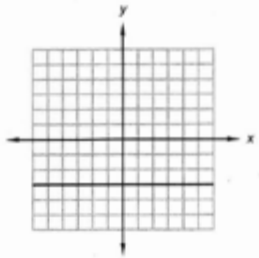
practice a. $\sqrt{56}$ b. $\sqrt{85}$

problem set 10

1. 1750 people 2. 8000 soldiers 3. 5310 men 4. –5, –3, –1 5. 4000 minas
6. 25,800 Argives 7. 9π cm^2 8. $x = 60$; $y = 60$; $z = 40$ 9. $x = 5$; $P = Q = 105$
10. 36 m^2; 6m 11.



12.

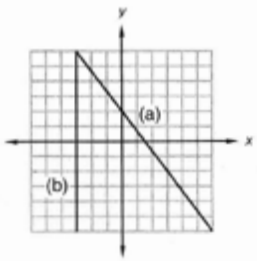


13. $\sqrt{33}$ 14. $5\sqrt{2}$ 15. 5 16. 2 17. $-\frac{12}{5}$ 18. $12 - 8x^2m$
19. $4 - 6xy^2p^{-2}$ 20. $3x^7y^4$ 21. $x^{-1}p^{-2}$ 22. $5x - 1$ 23. $9x^2yz^{-1}$
24. 3 cm 25. $-\frac{1}{3}$ 26. $\frac{11}{16}$ 27. $\frac{3}{32}$ 28. 2 29. 15 30. $-\frac{9}{8}$

practice a. $\frac{mz^4 + 3akz - 3y}{3bz^4}$ b. $\frac{ab^2z - ab^3k + 2mn}{ab^3}$ c. $x = 20$; $y = 80$

problem set 11

1. 780 people 2. 4, 6, 8, 10 3. \$3054 4. 600 people 5. 8800 plums
6. –3, –1, 1, 3 7. $x = 64$; $y = 116$; $z = 32$; $p = 64$ 8. 10 units^2 9. $2\pi^2$ cm
10. 8 m 11. $\frac{kx^2 + abcx - m}{ax^3}$ 12. $\frac{4p - 4ack + 3a^2}{4ak}$ 13. $\frac{4c^2m^2x - 12cp^2 - 5p}{4c^2px}$ 14. $\sqrt{105}$
15. $\sqrt{89}$ 16.



17. $\frac{3}{28}$ 18. 3 19. $\frac{3}{7}$ 20. $3 - 2a^{-4}$
21. $6 - 4y^2$ 22. $16p^9a^{-8}$ 23. $8x^{10}y^3m^{-1}$
24. 0 25. $-5ka$ 26. –1 27. $-\frac{1}{2}$
28. –72 29. $5\frac{1}{4}$ 30. 3

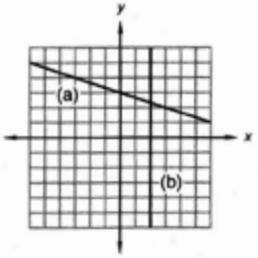
practice a. $y = -5$ b. $y = -\frac{1}{2}x - 1$

problem set 12

1. 1600 vases 2. –6, –5, –4, –3 3. 1200 4. $\frac{5}{11}$ 5. –5 6. 9000 miles 7. 30
8. $x = \frac{315}{11}$; $y = 20$ 9. $12\sqrt{6}$ cm 10. $A = 90$; $B = 60$; $C = 30$ 11. $\frac{mbcx^2 + bx^3 + c^2}{bcx^2}$

12. $\frac{a^3c - 3b^2c - 2a}{a^2bc}$ **13.** $\frac{b+a}{b}$ **14.** 12 **15.** $3\sqrt{13}$

16.



17. (a) $y = \frac{1}{3}x + 2$ (b) $y = -2$ **18.** $-\frac{13}{4}$ **19.** 5.5

20. $-\frac{20}{11}$ **21.** $-2a^{-3}xy^3$ **22.** $1 - 2x^{-4}$ **23.** $2x^{-4}y^8$

24. $64a^2b^{-5}$ **25.** $2ax^{-1}$ **26.** $-7abc$ **27.** $\frac{11}{32}$

28. $-\frac{1}{16}$ **29.** 102 **30.** –23

practice

a. (5, –2) **b.** $2\sqrt{5}$ m^2

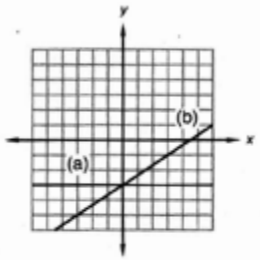
problem set 13

1. 450 boats **2.** 500,000 citizens **3.** 16, 18, 20, 22 **4.** 5 **5.** 10 units^2

6. $x = 10$; $y = \frac{45}{8}$; $P = 110$ **7.** $AB = 3$; $DC = \sqrt{97}$ **8.** (2, 1) **9.** (5, –7)

10. (0, 20) **11.** (13, 7) **12.** $\frac{4a+2}{a}$ **13.** $\frac{4a^2 + 5k^2}{4k}$

14. $\frac{am^2p^2 + amp + m}{ap^2}$ **15.** $2\sqrt{13}$ **16.**



17. (a) $x = 5$ (b) $y = -\frac{2}{3}x - 2$

18. $\frac{52}{63}$ **19.** –0.9 **20.** $-\frac{8}{5}$

21. $3 - \frac{2x^2a^2}{3}$

22. $-2a^2p^2 + 4a^{-3}m^{-2}p^{-1}$

23. $4x^{-3}a^{-6}$ **24.** $9m^2p^{-4}x^{-9}$

25. 0 **26.** $-2am^2p^{-1} + 5pam^{-2}$

27. $\frac{9}{8}$ **28.** 124 **29.** 11 **30.** –1

practice

a. $y = -x + 2$ **b.** $y = -\frac{2}{3}x + 4$

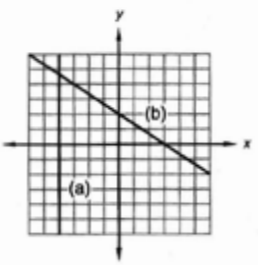
problem set 14

1. 2530 rats **2.** 17,150 sheep **3.** –10 **4.** 11, 13, 15 **5.** (5, –2) **6.** (5, –2)

7. (10, 18) **8.** (20, 2) **9.** $\frac{cy^2x + cyx^2 - 3x}{cy^2}$ **10.** $\frac{m+4x}{x}$ **11.** $\frac{4x + c - cx^2y}{x}$

12. $2\sqrt{77}$ cm^2 **13.** 8

14.



15. (a) $y = \frac{2}{3}x + 4$ (b) $y = -4$ **16.** $y = -x + 1$

17. $y = -\frac{3}{4}x + 3$ **18.** $A = 46$; $B = 44$; $C = 136$

19. $A = B = 15$; $C = D = 30$ **20.** $-\frac{1}{5}$ **21.** 110

22. $\frac{16}{5}$ **23.** $\frac{x}{y} + \frac{x^2}{3y^2}$ **24.** $\frac{y^5}{4x}$ **25.** $1 - 4m^2$

26. $-11xym^{-1} + 7xy^{-1}m^{-1}$ **27.** $-\frac{11}{36}$ **28.** 1

29. –5 **30.** –6

practice

(2, 3)

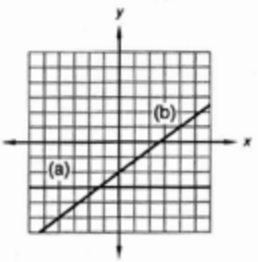
problem set 15

1. 7000 people **2.** 20% **3.** 4 **4.** –13, –12, –11 **5.** $(\frac{8}{3}, 3)$ **6.** (0, 5)

7. (4, 4) **8.** (3, –4) **9.** $\frac{3a^2y^3 + 3xy^2 - a^2mx}{3a^2y^2}$ **10.** $\frac{4x - 3a}{x}$

11. $\frac{cx + c^2 + ac^2x}{x}$ **12.** $4\sqrt{5}$ **13.** $\sqrt{85}$

14.



15. (a) $y = \frac{9}{2}$ (b) $y = -\frac{2}{3}x - 1$ **16.** $y = \frac{5}{6}x - \frac{1}{3}$

17. $y = -\frac{1}{7}x + \frac{33}{7}$

18. $A = 46$; $B = C = 44$; $k = y = 46$

19. $A = B = 20$; $C = D = 40$

20. $x = 7$; $P = 23$ **21.** $3 + 9xy^3p^2$ **22.** $\frac{81}{34}$ **23.** 6

24. $\frac{3}{8}$ **25.** y^{-5} **26.** $6m^2y^2$ **27.** $-\frac{1}{4}$ **28.** –9

29. 11 **30.** –25

practice $4x^2 + 9x + 34 + \frac{105}{x-3}$

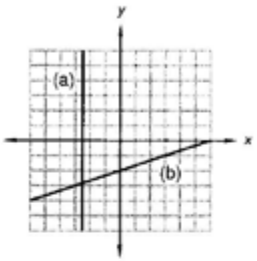
problem set 16

1. 420 **2.** 6720 microbes **3.** 1050 guests **4.** 12,900 people **5.** (2, 3) **6.** (3, 4)

7. (1, –1) **8.** (4, 0) **9.** $4x^3 - 2x^2 - 6x + 9$ **10.** $4x^2 + 10x + 34 + \frac{104}{x-3}$

11. $x^2 + 4x + 16 + \frac{56}{x-4}$ **12.** $\frac{4x^2+a}{2x^2}$ **13.** $\frac{16c+4c^3x-3}{4c^2x}$ **14.** $\sqrt{3}$ in.^{2} **15.** $\sqrt{53}$

16.



17. (a) $y = -4$ (b) $y = -\frac{1}{2}x + 3$ **18.** $y = -\frac{2}{7}x - \frac{32}{7}$

19. $y = \frac{3}{5}x + \frac{17}{5}$

20. $r_S = 1$ cm; $r_L = 2$ cm; $\text{Area}_L = 4\pi$ cm^2

21. $A = 30$; $B = 120$; $C = 60$; $D = 60$

22. $\frac{67}{70}$ **23.** 11 **24.** $-\frac{24}{5}$ **25.** $2 - \frac{y^2z}{3x^2}$ **26.** $\frac{x^4}{9y^2}$

27. $-6x^4y^5$ **28.** $\frac{25}{4}$ **29.** –22 **30.** –6

practice **a.** $N_N = 58$; $N_O = 2$ **b.** $T_M = -\frac{3}{2}$; $T_W = \frac{13}{2}$ **c.** $x = \frac{40}{9}$; $y = \frac{38}{9}$

problem set 17

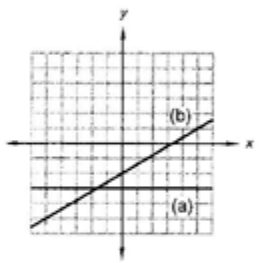
1. 1000 students **2.** 390 teachers **3.** 1440 skeptics **4.** 22, 23, 24

5. $N_D = -60$; $N_N = 210$ **6.** $N_D = 10$; $N_P = 40$ **7.** $4x^3 + 10x^2 + 10x + 6$

8. $3x^2 - 3x + 3 - \frac{5}{x+1}$ **9.** $T_M = 5$; $T_W = 0$ **10.** $T_E = 5$; $T_W = 4$

11. $T_M = 1$; $T_R = 4$ **12.** $\frac{4ax+3x}{a}$ **13.** $\frac{-2np^2x - rnp^2xy + 7s^2y^2}{np^2y}$ **14.** $6\sqrt{13}$ m^2

15. $2\sqrt{13}$ **16.**



17. (a) $y = -2x - 2$ (b) $x = 4$

18. $y = -\frac{5}{2}x + 12$ **19.** $y = -\frac{2}{7}x + \frac{29}{7}$

20. $x = -\frac{5}{2}$; $y = \frac{15}{2}$; $z = 70$ **21.** $\frac{49}{5}$ cm

22. $\frac{18}{11}$ **23.** 11.09 **24.** 13

25. $\frac{1}{y^2m} - \frac{3x^2m^2}{y}$ **26.** $\frac{x^4y^2}{8}$

27. $-2xy^3 + 7y$ **28.** –3 **29.** $-10\frac{7}{8}$

30. –30

practice **a.** 75 malefactors **b.** 4000 kg **c.** $a = \frac{45}{4}$; $b = \frac{27}{2}$

problem set 18

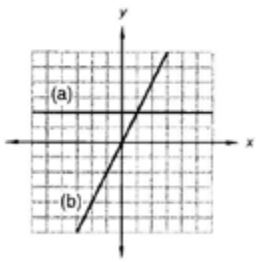
1. 40 Arabians **2.** 5000 kg **3.** 200,000 natives **4.** 1,000,000

5. $N_D = 150$; $N_Q = 50$ **6.** $N_D = 29$; $N_P = 1$ **7.** $6x^3 + 8x^2 - 28x - 40$

8. $5x^2 + 10x + 20 + \frac{39}{x-2}$ **9.** $R_F = 96$; $R_S = 80$ **10.** $T_M = 1$; $T_R = 4$

11. $T_B = 8$; $T_G = 5$ **12.** $\frac{7x^2y^2z^2+1}{xyz}$ **13.** $\frac{-3x^2y^2 - cxy^3 + 7c}{xy^3}$ **14.** $5\sqrt{11}$ cm^2 **15.** $7\sqrt{2}$

16.



17. (a) $y = -3$ (b) $y = -3x$ **18.** $y = -x + 2$

19. $y = \frac{5}{3}x - \frac{26}{3}$ **20.** $a = 12$; $b = 15$

21. $x = 6$; $P = 20$ **22.** 235.5 ft^2 **23.** $\frac{9}{20}$ **24.** $-\frac{3}{2}$

25. $\frac{6x}{pyz^3} - \frac{27x^2}{z^2}$ **26.** $x^3y^2a^{-5}$ **27.** 0 **28.** $-\frac{1}{2}$

29. –10 **30.** –19

practice **a.** $N = 30$ nickels; $D = 50$ dimes **b.** 15 daffodils **c.** $x = \frac{25}{3}$; $y = \frac{20}{3}$

problem set 19

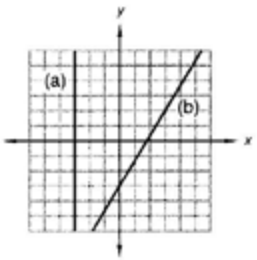
1. $N_N = 20$ nickels; $N_D = 40$ dimes **2.** 10 codfish **3.** 198 tons

4. Beginning amount = 1400 liters; Amount used = 266 liters **5.** –2 **6.** (3, –7)

7. $x^5 - 2x^4 - 4x^3 + 8x^2 + 4x - 8$ **8.** $-3x^2 - 6x - 12 - \frac{26}{x-2}$ **9.** $T_H = T_S = 2$

10. $R_F = 60$; $R_S = 50$ **11.** $T_R = 4$; $T_M = 1$ **12.** $\frac{28y^2z + 3x^2}{7y^2z}$ **13.** $\frac{ay - 2b - 2cx^2y}{2x^2y}$

14. $x = \frac{21}{5}$; $y = \frac{28}{5}$; $z = 6$ **15.** $\sqrt{106}$ **16.**



17. (a) $y = 2$ (b) $y = 2x$

18. $y = \frac{9}{5}x + \frac{2}{5}$ **19.** $y = \frac{2}{7}x - \frac{29}{7}$

20. $x = 20$; $y = \frac{55}{9}$; $k = 115$

21. $A = 50$; $B = 130$; $C = D = 25$;
Area $\approx 3.93\ \text{cm}^2$ **22.** $\frac{23}{39}$

23. -100 **24.** $-\frac{1}{2}$ **25.** $-3x + 9px^{-1}y^3$

26. $x^{-1}y^4$ **27.** $3x^2ay^{-1}$ **28.** $-\frac{35}{108}$

29. 1 **30.** -16

practice

a. $8\sqrt{10} - 6\sqrt{35}$ **b.** 6 **c.** $y = \frac{1}{3}x + 2$

problem set 20

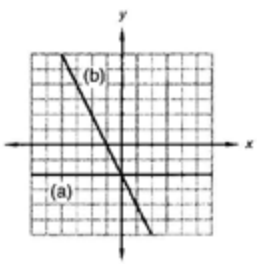
1. 560 kg **2.** $P = 40$ performers; $N_V = 12$ virtuosos

3. $N_W = 10$ worthless ones; $N_E = 13$ expensive ones **4.** 360 tons **5.** $-4, -2, 0, 2$

6. (4, 16) **7.** $-2x^2 - 2x - 3 - \frac{1}{x-1}$ **8.** $T_B = 8$; $T_G = 5$ **9.** $72 - 50\sqrt{3}$

10. $24 - 12\sqrt{2}$ **11.** $50 - 75\sqrt{2}$ **12.** $\frac{m^2 + 5x - mx^2}{ax^2}$

13. $\frac{2a^5 - 2a^5x^2 - 3x^3}{2a^4x^2}$ **14.** $3\sqrt{7}\ \text{ft}^2$ **15.** $z = \frac{24}{5}$; $A = \frac{28}{5}$ **16.**



17. (a) $y = 1$ (b) $y = -x$ **18.** $y = \frac{1}{3}x - \frac{5}{3}$

19. $y = -\frac{1}{12}x + \frac{31}{6}$

20. $A = 40$; $B = C = 50$; $P = y = 40$

21. $\frac{25}{4}$ **22.** -5 **23.** 0

24. $2x$ **25.** $-\frac{x^4}{2x^2}$ **26.** $-2xa^{-1} - 5x^{-1}a^{-1}$

27. $-\frac{129}{512}$ **28.** 19 **29.** 3 **30.** 27

practice

a. 48 and 60 **b.** 93 and 43

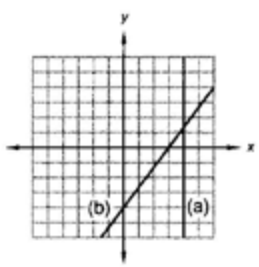
problem set 21

1. 36 and 60 **2.** 133 and 67 **3.** 2250 kg **4.** 185 kg **5.** 25 nickels

6. $-5, -4, -3$ **7.** (6, 5) **8.** $8x^3 - 16x^2 + 10x - 6$ **9.** $T_K = 8$; $T_N = 16$

10. $50\sqrt{2}$ **11.** $144 - 24\sqrt{3}$ **12.** $\frac{4px + 1}{p}$ **13.** $\frac{m^2 - 3ax - a^2mx}{a^2x^2}$ **14.** 1.5×10^{-13}

15. 7 **16.**



17. (a) $y = -2$ (b) $y = -2x$ **18.** $y = -5$

19. $y = -\frac{3}{7}x + \frac{20}{7}$ **20.** $x = 2$; $y = 8$

21. $A = 50$; $B = C = 40$; $D = y = 50$

22. $\frac{39}{128}$ **23.** 24 **24.** 14

25. $-10x^{-4} - 5x^{-3}$ **26.** $4x^6y^2$ **27.** $5xa$

28. $-\frac{1}{12}$ **29.** 0 **30.** 5

practice

a. ⟶| 126 miles **b.** $x = \frac{35}{6}$; $y = \frac{15}{2}$

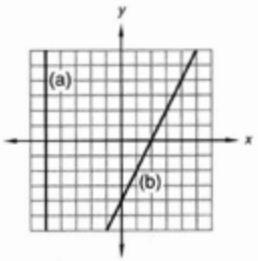
problem set 22

1. ⟶| 90 miles **2.** ⟶| 18 kph **3.** 560 and 400 **4.** \$3700

5. 8 pecks **6.** 4750 grams **7.** (4, 4) **8.** $x^2 + x - 3 - \frac{1}{x-1}$ **9.** $x = 18$; $y = \frac{11}{2}$

10. $-9\sqrt{3}$ **11.** $48\sqrt{3} - 70$ **12.** $30 - 12\sqrt{2}$ **13.** $\frac{2x + 1}{x}$ **14.** $\frac{5x^2p + p^3y - 3x}{py}$

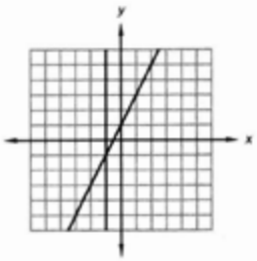
15. 2×10^{-2} **16.**



17. (a) $x = -4$ (b) $y = -\frac{3}{2}x + 3$
18. $y = \frac{1}{3}x - 2$ **19.** $3\sqrt{10}$
20. $y = \frac{2}{5}x - \frac{31}{5}$
21. $A = 40$; $B = C = 50$; $k = 40$; $M = 50$
22. $-\frac{45}{14}$ **23.** 3.5 **24.** 4
25. $1 - 3x^2y^{-7}p^{-2}$ **26.** $4x^{10}y^{-1}p^{-1}$
27. $-6y$ **28.** $-\frac{7}{200}$ **29.** 16 **30.** 43

practice

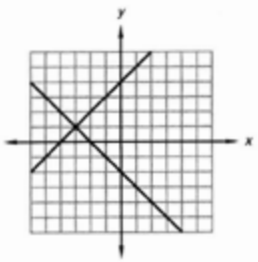
(–1, –1)



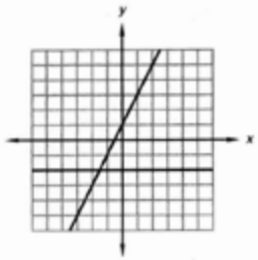
problem set 23

1. ⟹ 12 minutes **2.** ⟹ 600 km **3.** $\frac{110}{120}$

4. $N_V = 175$ viands; $N_S = 125$ sandwiches **5.** $N_N = 50$ nickels; $N_Q = 10$ quarters
6. 320 tons **7.** (10, 10) **8.** $6x^5 - 3x^4 - 16x^3 + 2x^2 + 8x$ **9.** $144\sqrt{3}$ **10.** $-\sqrt{3}$
11. $50 - 30\sqrt{3}$ **12.** $\frac{3x^2y^2m + 4}{x}$ **13.** $\frac{5x^2p - 4p^2m + c}{p^2m}$ **14.** 1×10^{-36}
15. (–3, 1)



16. $(-\frac{3}{2}, -2)$



17. $y = \frac{1}{2}x$ **18.** $2\sqrt{5}$ **19.** $y = -\frac{3}{8}x + \frac{11}{2}$
20. $BC = 12$ m; $CM = 6$ m; $\text{Area}_{ACM} = 15\ \text{m}^2$ **21.** $x = \frac{28}{3}$; $y = \frac{18}{7}$ **22.** $-\frac{38}{39}$
23. 3 **24.** 42 **25.** $1 - 3x^{-1}$ **26.** $\frac{x^4}{9y}$ **27.** $6mx^{-1}$ **28.** $\frac{3}{2}$ **29.** 6 **30.** $8\frac{1}{4}$

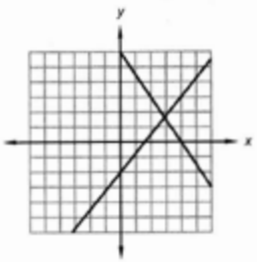
practice

a. $\frac{5}{3}$ **b.** $\frac{9}{14}$ **c.** $x = \frac{9}{2}$; $y = 10$

problem set 24

1. ⟹ 45 mph **2.** ⟹ 20 miles **3.** $\frac{50}{70}$

4. $Q_C = 92$ quarts; $Q_N = 81$ quarts **5.** 20 measures **6.** 4140 kilograms **7.** (8, 7)
8. $-3x^2 + 6x - 12 - \frac{27}{-x - 2}$ **9.** $720\sqrt{2}$ **10.** $6\sqrt{7}$ **11.** $30 - 36\sqrt{6}$
12. $20\sqrt{5} - 12$ **13.** $\frac{4m^4y^2p + 6}{m^2y}$ **14.** $\frac{k^2pc + 2p^2c^2 - 8}{2p^2c}$ **15.** 1×10^{-19}
16. $(\frac{32}{11}, \frac{18}{11})$



17. (a) $y = \frac{5}{6}x + 2$ (b) $y = -4$
18. $A = 70$; $B = 110$; $C = D = 35$; $\text{Area} = 9.77\ \text{cm}^2$ **19.** $2\sqrt{17}\ \text{in.}^2$
20. $y = 2x + 9$ **21.** $y = \frac{2}{9}x - \frac{37}{9}$ **22.** $\frac{15}{4}$
23. $\frac{7}{16}$ **24.** 2 **25.** –250 **26.** $\frac{3}{2}$
27. $1 + 5x^3y$ **28.** $-32x^3y^{-2}$
29. $-2p^2xy^{-1} - 5p^2x^7y^{-1}$ **30.** $-\frac{1}{36}$

practice

a. $2m^2xy(4y^4 + 3mx - 1)$ **b.** $4m^3 + 1$ **c.** $x = \frac{15}{4}$; $y = \frac{49}{4}$
d. $M = \frac{24}{7}$; $N = \frac{21}{4}$

problem set 25

1. 95 days **2.**  720 km **3.** $N_B = 50$ boys; $N_G = 10$ girls

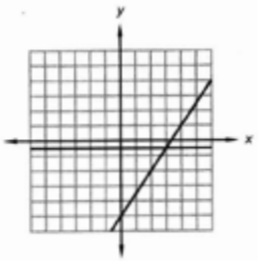
4. 700 minor disasters **5.** $N_Q = 100$ quarters; $N_H = 100$ half-dollars **6.** 2200 grams

7. $x^2 + 5x + 25 + \frac{123}{x-5}$ **8.** $xy(5xy - 2 + 10y)$ **9.** $x^2ym^2(y^2m^3 + 12xm^2 - 3y)$

10. $4mp^2y(4mp - 2py^3 + my)$ **11.** $x^2yz(xyz^2 + z - 3x)$ **12.** $p^3x(p^2x^2 + px - 1)$

13. $180\sqrt{6}$ **14.** $13\sqrt{2}$ **15.** $30\sqrt{3} - 20$ **16.** $\frac{ab+a}{b}$

17. $\frac{ax^2 - cm^2p + 2mp}{m^2p}$ **18.** 6×10^{14} **19.** $(3, -\frac{1}{2})$



20. $y = \frac{1}{6}x + \frac{9}{2}$

21. $x = 20$; $y = 10$; $P = \frac{99}{7}$

22. 58.61 cm **23.** 7 **24.** 7

25. $\frac{17}{7}$ **26.** $\frac{7}{10}$ **27.** $2x^2 + 3$

28. $2y^{-4} - 4x^4y^{-2}$ **29.** 16

30. $\frac{5}{192}$

practice

a. $(x - 7)(x + 1)$ **b.** $(-1)(x - 8)(x + 2)$ **c.** $-3x^2(x - 8)(x + 1)$

d. $A = \sqrt{41}$; $B = \frac{3\sqrt{41}}{5}$; $C = \frac{32}{5}$

problem set 26

1.  800 miles **2.** $N_B = 250$ blues; $N_R = 40$ reds

3. $N_F = 1000$ fives; $N_T = 200$ tens **4.** 700 **5.** 2080 grams **6.** 8100

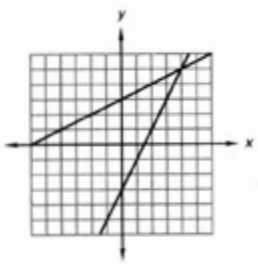
7. $x^3 - x^2 + x - 1 - \frac{1}{x+1}$ **8.** $7x^4y^2m(5x^3y^3 - xm + 2y^5m)$

9. $2xym(3xm^4 - x + 2)$ **10.** $2xy^4p^5(2xp - y^3 + 4x^3y)$ **11.** $(x + 3)(x - 2)$

12. $(x - 4)(x - 2)$ **13.** $ab(x + 2)(x - 1)$ **14.** $6x - 1$ **15.** $108\sqrt{2}$ **16.** $9\sqrt{3} - 40$

17. $15\sqrt{6} - 12$ **18.** $\frac{a^2cm - cx^4 - x^4}{cx^2}$ **19.** 6×10^{-22}

20. (4, 5)



21. $\sqrt{58}$ **22.** $A = \sqrt{41}$; $B = \frac{3\sqrt{41}}{4}$; $C = \frac{35}{4}$

23. $x = 80$; $y = 30$; $m = 150$; $z = 20$

24. $x = \frac{152}{11}$; $y = \frac{162}{11}$

25. $BC = 12$ m; $A_{\text{Circle}} \approx 452.16$ m^2 **26.** -66

27. $-\frac{21}{2}$ **28.** $-\frac{37}{19}$ **29.** $-8x^8y$ **30.** 1

practice

a. $\frac{6m^3 + 23m^2 + 2m + 8}{m^2(m+4)}$ **b.** $\frac{z^2 + 2z - 1}{z(z+4)(z+1)}$

problem set 27

1.  60 miles **2.**  40 kilometers **3.** $N_G = 26$ girls; $N_B = 10$ boys

4. 14, 21, 28 **5.** 1800 grams **6.** 600 grams **7.** $x^2 + 2x + 4 + \frac{2}{x-2}$

8. $3m^2x^2p^2(3x^2 + p^4m^2 - 2x^2m)$ **9.** $mx^2y(x^2 - y^2 - 4)$

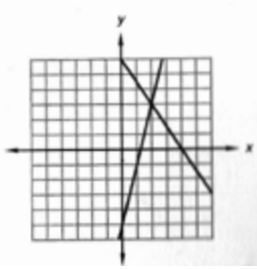
10. $a^2x^3p(1 - 4a - x)$ **11.** $a(x + 5)(x - 1)$ **12.** $-x(x - 5)(x - 3)$

13. $-ax(x + 8)(x - 3)$ **14.** $-ax^2(x - 5)(x + 1)$ **15.** $p(x - 8)(x - 7)$

16. $a + 1$ **17.** $3\sqrt{2} - 36$ **18.** $19\sqrt{5}$ **19.** $6\sqrt{6} - 18$

20. $\frac{5x + 2p}{x(x+p)}$ **21.** $\frac{6x^3 + 33x^2 + 3x + 18}{x^2(x+6)}$ **22.** 4×10^1 **23.** (2, 3)

24. $y = -\frac{3}{8}x - \frac{33}{8}$ **25.** $A = \sqrt{65}$; $B = \frac{5\sqrt{65}}{7}$; $C = \frac{48}{7}$



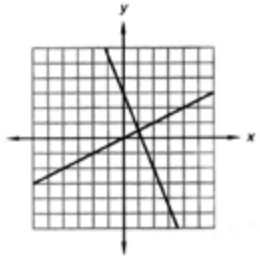
26. $x = \frac{18}{5}$; $y = \frac{56}{5}$ **27.** $\frac{97}{3}$ **28.** $-\frac{19}{6}$ **29.** $5a^{-2}b^{-1}y$

30. -55

practice a. $\frac{m}{z+x}$ b. $\frac{m}{z}$ c. $\frac{2\sqrt{2}}{3}$

problem set 28

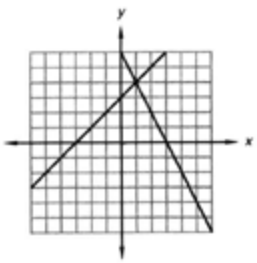
1. ⟷ 60 miles 2. $-9, -6, -3, 0$ 3. N_G = 11 girls; N_B = 4 boys
4. N_N = 400 nickels; N_D = 100 dimes 5. 142,500 peasants
6. M_A = 1400 kg of arsenic; Entire mixture = 8750 kg 7. $x^2 + 5x + 25 + \frac{118}{x-5}$
8. $2x^2y(1 - 4x^2y^3)$ 9. $x^2y^3p(4p^2 - 16 - x^2p^3)$ 10. $xy(x + 7)(x - 5)$
11. $a(x - 8)(x + 1)$ 12. $m^2(x + 2)(x + 1)$ 13. $-a^2(x + 1)(x + 1)$
14. $4x + 1$ 15. $10\sqrt{3}$ 16. $15\sqrt{3} - 30$ 17. 2×10^{-5}
18. $\frac{x}{y}$ 19. $\frac{\sqrt{15}}{20}$ 20. $\frac{4a^2 + 6(a+x)}{a(a+x)}$ 21. $\frac{5x+3}{(x+1)^2}$ 22. $(1, \frac{1}{2})$
23. (a) $y = -4$ (b) $y = -\frac{1}{3}x + 2$
24. $A = 30$; $B = C = 60$; $D = 30$; $E = 60$; $F = 80$
25. $x = 30$; $2x = 60$; 2.09 m^2; 2.09 m 26. $\frac{24}{13}$ 27. $\frac{139}{66}$
28. $4\sqrt{5}$ 29. $1 - 12x^{-4}y^3z^2$ 30. $\frac{35}{36}$



practice ⟷ R_C = 3 mph; R_M = 6 mph

problem set 29

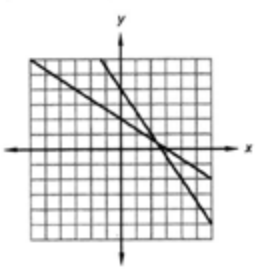
1. ⟷ 4 hr 2. ⟷ 6 mph
3. ⟷ R_M = 500 kph; R_R = 900 kph 4. 175 roses 5. 3,900,000 places
6. 140,000 hiding places 7. $x^2 + 2x + 5$ 8. $8x^2y^2z^2(2xz - 1)$
9. $2x^2yp^2(p^2 - 3xp - 1)$ 10. $a^2(x + 97)(x + 5)$
11. $-m^2(x + 1)(x + 1)$ 12. $k(x + 8)(x - 5)$ 13. $1 + a$
14. $-6\sqrt{3}$ 15. $18\sqrt{2} - 24$ 16. 1×10^{23} 17. $\frac{m}{m+x}$ 18. $\frac{a}{b}$ 19. $\frac{\sqrt{3}}{10}$
20. $\frac{14\sqrt{3}}{45}$ 21. $\frac{4x^2 + 14x + 24}{(x+4)(x+2)}$ 22. $\frac{-5m^2 - 7m}{(m+2)(m+1)}$ 23. $(1, 4)$
24. $y = -\frac{3}{8}x - \frac{9}{4}$
25. r = 50 m; Arc length = 10π m ≈ 31.4 m
26. $A = 3\sqrt{13}$; $B = \frac{4\sqrt{13}}{3}$; $C = \frac{26}{3}$ 27. $\frac{58}{49}$ 28. 20
29. $x^{-6}y^{15}z^{-9}$ 30. $\frac{25}{108}$



practice a. Valid; conclusion follows from premise. b. Invalid; major premise has been reversed.

problem set 30

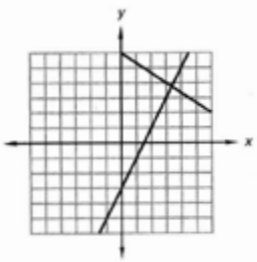
1. 480 grams 2. 500 grams 3. ⟷ 8 mph
4. N_D = 10 daisies; N_P = 25 prunes 5. N_Q = 5 quarters; N_D = 10 dimes
6. (a) 400 ft^2 (b) 100 ft 7. $x^2 - x + 1 + \frac{1}{x+1}$ 8. $-a^2(x - 7)(x + 5)$
9. $3(x - 5)(x - 2)$ 10. $-ab(x - 5)(x - 5)$ 11. $a^2b^2(x + 7)(x + 2)$ 12. $1 - 4x$
13. $-17\sqrt{2}$ 14. $72 - 18\sqrt{6}$ 15. 7×10^{49} 16. $\frac{x}{x+y}$ 17. $\frac{a}{p}$ 18. $\frac{\sqrt{6}}{9}$
19. $\frac{\sqrt{2}}{15}$ 20. $\frac{9a^2 + 6a + 8}{2a(a+4)}$ 21. $\frac{6x+6}{(x+2)(x+3)}$ 22. $(\frac{12}{5}, \frac{2}{5})$
23. $y = -\frac{1}{3}x + \frac{10}{3}$ 24. 114.2 m^2 25. (C)
26. $-\frac{63}{5}$ 27. -18 28. $\frac{11}{10}$ 29. $\frac{2a^2xy}{p} - \frac{a^2x^2y}{p}$
30. $\frac{7}{16}$



practice $y = -4x + 6$

problem set 31

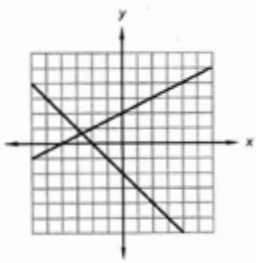
1. 40, 45, 50, 55
2. |⟵●⟶| 8 p.m.
3. |⟶ ⟵| 60 miles
4. N_T = 40 tomato plants; N_P = 30 pansy plants
5. 12,000 kg
6. 120 grams
7. $y = -3x + 3$
8. 3×10^{-31}
9. $\frac{a}{a+b}$
10. $\frac{4}{m}$
11. $\frac{3\sqrt{5}}{10}$
12. $\frac{7\sqrt{2}}{6}$
13. $\sqrt{3}$
14. $30 - 24\sqrt{3}$
15. $1 + 4x$
16. $\frac{x^2+3x+3}{(x+2)^2}$
17. $\frac{x+2}{x-3}$
18. $-x(x-3)(x-2)$
19. $2ax(x-5)(x-4)$
20. $pa(x-2)(x-1)$
21. $mc(x+5)(x-2)$
22. -3
23. $\frac{2}{25}$
24. $(\frac{27}{8}, \frac{15}{4})$
25. $x^3 - x^2 + x - 1 - \frac{1}{x+1}$
26. $(\frac{1}{2}, 2)$
27. $\frac{25}{4}$
28. $-\frac{1}{2}$
29. $A = 120$; $B = 150$; $C = 30$; $D = 30$; $E = 60$; $F = 30$; $P = 60$
30. $A_{\text{Circle}} = 9\pi\ \text{m}^2$; $d = 6$ m; $A_{\text{Square}} = 144\ \text{m}^2$



practice a. $\frac{8\sqrt{15}}{15}$ b. $-\frac{17\sqrt{14}}{14}$ c. $x = 1$; $p = 3$

problem set 32

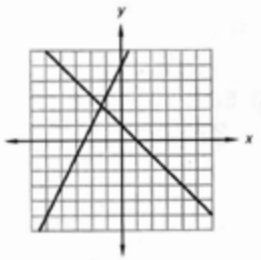
1. |⟵●⟶| D_W = 24 miles; D_J = 32 miles
2. N_L = 60 large ones; N_S = 10 small ones
3. N_N = 40 nickels; N_D = 70 dimes
4. 500 kg
5. 1200 grams
6. 2200 students
7. $\frac{5\sqrt{6}}{6}$
8. $-\frac{11\sqrt{35}}{35}$
9. $-\frac{19\sqrt{15}}{15}$
10. $s = 8$ m; $r = 2$ m; $A_{\text{Circle}} = 12.56\ \text{m}^2$
11. 30°
12. $y = -\frac{1}{3}x + \frac{8}{3}$
13. 1×10^{-10}
14. $\frac{x+4y}{x+y}$
15. $1 + 4xy$
16. $15\sqrt{5}$
17. $40\sqrt{2} - 60$
18. $\frac{x^2+2}{(x+3)(x+2)}$
19. $\frac{m^2-2}{m(m-5)}$
20. $-2x(x-3)(x-1)$
21. $x^3(x+7)(x-2)$
22. $ax(x-7)(x-1)$
23. $py(x+6)(x-2)$
24. $-\frac{21}{13}$
25. -30
26. $(-\frac{8}{3}, \frac{2}{3})$
27. $4x^4 + 2x^3 - 8x^2 + 12x + 8$
28. $(\frac{19}{7}, \frac{8}{7})$
29. $7\sqrt{2}$
30. -2



practice a. $\frac{mz+3}{rz}$ b. $\frac{(ax+mx+my)(y+s)}{am(a+m)}$

problem set 33

1. 442 hedonists
2. 2800 grams
3. 2025 grams
4. N_R = 50 reds; N_B = 5 blues
5. |⟵●⟶| 240 miles
6. $\frac{mx+3}{xy}$
7. $\frac{(s+x)(bs+ax+bx)}{ab(a+b)}$
8. $x = 140$; $y = 20$; $z = 40$; 4.19 cm
9. $x = 75$; $y = 70$; $z = 140$
10. $y = \frac{5}{3}x + \frac{26}{3}$
11. $\frac{11\sqrt{10}}{10}$
12. $\frac{4\sqrt{30}}{15}$
13. 23.28 cm
14. 20°
15. 1.5×10^{-22}
16. $\frac{x^2+4xy}{1-xy}$
17. $12\sqrt{2}$
18. $1 + y$
19. $\frac{ax+b(x+y)+x^2(cx+4)}{x^2(x+y)}$
20. $\frac{-2x-6}{(x+4)(x-2)}$
21. $-x^2(x-5)(x+1)$
22. $k^2(x-5)(x-2)$
23. $ap(x-5)(x+4)$
24. -23
25. $\frac{36}{5}$
26. $(-\frac{4}{3}, \frac{7}{3})$
27. $2x^3 + 4x^2 + 8x + 15 + \frac{30}{x-2}$
28. 36
29. 12 ft
30. 8 ft^2



practice 11 a.m.

problem set 34

1. 5 p.m. **2.** 4 hr **3.** 30 mi

4. 60 tons **5.** 150 g **6.** 6, 7, 8 **7.** $\frac{y - a^2b^2}{b - a^2}$ **8.** $\frac{1 - bx}{x^2}$

9. 258.99 m^3 **10.** 10 **11.** $y = \frac{1}{2}x$ **12.** $\frac{-23\sqrt{2}}{6}$ **13.** 0

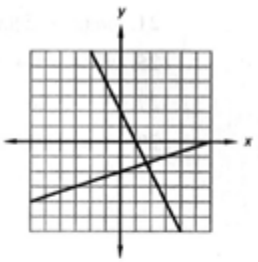
14. 602.88 1-cm-square floor tiles **15.** 1.4×10^{-16} **16.** $\frac{4y^2 + x}{3y^2 - 1}$ **17.** $28\sqrt{3}$ **18.** $1 - 5y$

19. $\frac{ax^2 + bx^2 + cx(x + y)}{x^3(x + y)}$ **20.** $\frac{x^2 - 9x + 13}{(x - 3)^2}$ **21.** $2x^2(x + 2)(x - 1)$ **22.** $ap(x - 4)(x + 2)$

23. $y(x - 2)(x - 2)$ **24.** $-\frac{13}{2}$ **25.** $-\frac{9}{2}$ **26.** $(\frac{12}{7}, -\frac{10}{7})$

27. $x^4 + 3x^3 + 5x^2 + 3x$ **28.** $(-\frac{2}{7}, -\frac{10}{7})$

29. $6\sqrt{2}$ cm^2 **30.** -12



practice **a.** 2160° **b.** 360° **c.** $\frac{1}{8}$ **d.** 16 **e.** $-\frac{1}{25}$

problem set 35

1. R_M = 20 yards per minute; R_L = 60 yards per minute

2. Trudged for 8 hours; walked briskly for 4 hours

3. 36 miles **4.** $N_B = 10$; $N_Y = 4$ **5.** 100 tons **6.** 400 grams

7. 325.6 m^2 **8.** $\frac{1}{4}$ **9.** $\frac{1}{3}$ **10.** 27 **11.** $-\frac{1}{16}$ **12.** $x = 36$; $y = 6$; $A = \frac{63}{5}$

13. $\frac{31\sqrt{35}}{35}$ **14.** $-\frac{41\sqrt{10}}{10}$ **15.** $\frac{a - 4b}{xy}$ **16.** $\frac{7x + 6y}{4}$ **17.** $x = 35$; $y = 30$; $k = 150$

18. $x = 14$; $y = 126$ **19.** $x = 98$; $y = 93$; $p = 75$ **20.** $y = -\frac{4}{3}x + \frac{1}{3}$

21. $\frac{2x^2 - 2x + 4}{x^2(x + y)}$ **22.** $\frac{x(3x + 7)}{(x - 2)(x + 3)}$ **23.** $-a(x + 7)(x - 5)$ **24.** $-x^2(x + 4)(x - 2)$

25. $36 - 14\sqrt{3}$ **26.** 1×10^{10} **27.** $-\frac{76}{5}$ **28.** 30 **29.** $\frac{9}{4}$ **30.** $\sqrt{122}$

practice **a.** $\frac{x - 9}{x - 2}$ **b.** $\frac{x + 4}{x + 3}$

problem set 36

1. 1360 words **2.** $N_F = 20$ fats; $N_L = 10$ leans **3.** $\frac{15}{25}$ **4.** 400 miles

5. 50 mph **6.** 49, 56, 63, 70 **7.** 3 in. **8.** $\frac{(x + 5)(x - 4)(x + 2)}{(x - 2)(x + 1)(x - 5)}$

9. $\frac{(x + 3)(x - 5)}{(x - 8)(x + 4)}$ **10.** -9 **11.** $-\frac{1}{9}$ **12.** 27 **13.** $\frac{1}{9}$ **14.** $\frac{y + 4x}{3xy + 1}$ **15.** $\frac{4 - 3x}{7 + 2x}$

16. $\frac{3\sqrt{15}}{5}$ **17.** 1×10^7 **18.** $\frac{5\sqrt{21}}{21}$ **19.** $24\sqrt{6} - 96$ **20.** $5\sqrt{7}$ **21.** $\frac{-3x^2 + 6x + 6}{x^2(x + 2)(x + 1)}$

22. $\frac{pax^2 + ax(cx + a) + mx + b}{a^2x^4}$ **23.** $\frac{2}{3}$ **24.** 8 **25.** (a) $y = 2$ (b) $y = \frac{1}{3}x - 2$

26. $A = 40$; $B = 40$; $C = 80$; $D = 40$; $E = 50$; $M = 50$ **27.** $x^3 - x^2 + x - 1 - \frac{1}{x + 1}$

28. $\sqrt{130}$ **29.** $3 - 3x^{-5}y^3$ **30.** -16

practice **a.** 120 grams **b.** $m\angle BCD = 55°$; $m\angle DAB = 55°$; $x = 4$; $y = 6$ **c.** $x = 70$; $y = 5$

problem set 37

1. 4800 grams **2.** 700 grams **3.** 525 grams

4. D_T = 200 miles; D_B = 100 miles **5.** 200 gestures **6.** $\frac{x + 1}{x + 4}$

7. $x - 2$ **8.** $-\frac{1}{16}$ **9.** $\frac{1}{81}$ **10.** $-\frac{1}{81}$ **11.** 81 **12.** $m\angle PON = 95°$; $x = 14$; $y = 5$

13. $x = 100$; $y = 90$; $z = 80$ **14.** $\frac{x^3 + 1}{x^4 - 2}$ **15.** $\frac{ax + y}{ax - my}$ **16.** $\frac{-29\sqrt{14}}{14}$ **17.** $\frac{7\sqrt{33}}{33}$

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