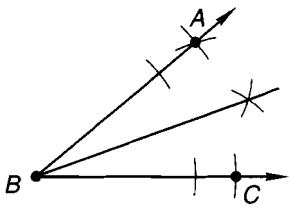
Test 1

1. (1)
$$3(90 - A) = (180 - A) - 60$$
$$270 - 3A = 120 - A$$
$$2A = 150$$
$$A = \mathbf{75°}$$

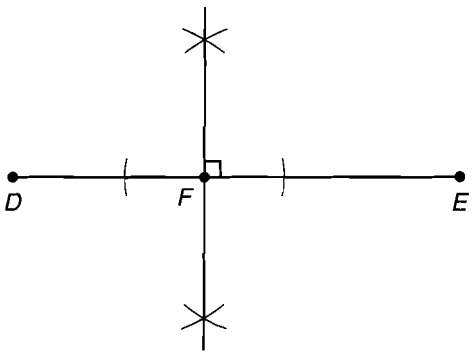
2. (R)
$$\frac{s}{t} = \frac{8}{5}$$
$$\frac{1400}{t} = \frac{8}{5}$$
$$8t = 7000$$
$$t = \mathbf{875}$$

3. (R)
$$\frac{72}{100} = \frac{936}{T}$$
$$72T = 93{,}600$$
$$T = \mathbf{1300}$$

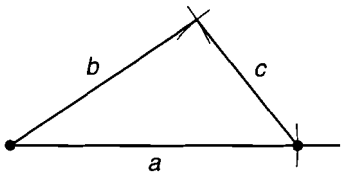
4. (4)



5. (4)



6. (4)



7. (R)
$$x - 3y = 0$$
$$x = 3y$$
$$2x + 6y = -36$$
$$2(3y) + 6y = -36$$
$$12y = -36$$
$$y = \mathbf{-3}$$
$$x = 3y$$
$$x = 3(-3)$$
$$x = \mathbf{-9}$$

8. (R)
$$6(x + x^0 - 1) = 2(-x + 8)$$
$$6x + 6 - 6 = -2x + 16$$
$$8x = 16$$
$$x = \mathbf{2}$$

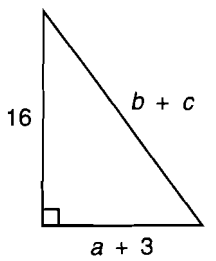
9. (R)
$$\frac{5}{x(x+1)} + \frac{4}{(x+1)} + \frac{3}{x}$$
$$= \frac{5 + 4x + 3(x+1)}{x(x+1)} = \frac{\mathbf{7x + 8}}{\mathbf{x^2 + x}}$$

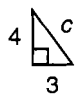
10. (R)
$$\frac{4p^3s^{-5}}{p^{-3}s}\left(\frac{2^{-1}p^{-2}s}{p^3} + \frac{p^2s^3}{s^{-3}}\right)$$
$$= \frac{4p^6}{s^6}\left(\frac{s}{2p^5} + p^2s^6\right) = \frac{\mathbf{2p}}{\mathbf{s^5}} + \mathbf{4p^8}$$

11. (3)
$$c^2 \bigcirc a^2 + b^2$$
$$8^2 \bigcirc 6^2 + 5^2$$
$$64 \bigcirc 36 + 25$$
$$64 > 61$$

Since the square of the largest side is greater than the sum of the squares of the other two sides, the triangle is an **obtuse triangle.**

12. (3)





$$c^2 = 4^2 + 3^2$$
$$c = \sqrt{16 + 9}$$
$$\boldsymbol{c = 5}$$

$$\frac{4}{16} = \frac{3}{3 + a}$$
$$12 + 4a = 48$$
$$4a = 36$$
$$\boldsymbol{a = 9}$$

$$\frac{4}{16} = \frac{c}{b + c}$$
$$\frac{4}{16} = \frac{5}{b + 5}$$
$$4b + 20 = 80$$
$$4b = 60$$
$$\boldsymbol{b = 15}$$

problem set 1

1. 30° **2.** 10° **3.** 40° **4.** 1775 grams **5.** 36 **6.** $\frac{x^4y^2}{8}$ **7.** $-\frac{87}{8}$

8. $7y - 2xy^3$ **9.** $\frac{1}{y^2m} - \frac{3x^2m^2}{y}$ **10.** 13 **11.** −3 **12.** $\frac{x^2 + 2x + 2}{x^2 + x}$

13. $4x^3 + 10x^2 + 10x + 6$ **14.** $N_N = 10$; $N_D = 40$ **15.** $N_P = 40$; $N_D = 10$

16. $N_N = 15$; $N_D = 8$ **17.** Two line segments are congruent if the segments have equal length.

18. An acute angle is an angle whose measure is greater than 0° and less than 90°.

19. $x = 36$; $y = 108$ **20.** $A = 120$; $B = 30$; $C = 40$ **21.** $A = 20$; $B = 50$; $C = 40$

22. 6 **23.** $2\pi^2$ cm **24.** $4\sqrt{3}$ in.^{2} **25.** $18\sqrt{2}$ cm **26.** 3π m^2 **27.** 288π cm^2

28. $(208 - 52\pi)$ m^2 = 44.64 m^2 **29.** A **30.** B

problem set 2

1. 40° **2.** 30° **3.** $N_R = 5$; $N_B = 8$ **4.** 2091 **5.** 2025 gallons **6.** $\frac{5a^7}{b^4}$

7. −15 **8.** $6r^2s - 5rs^2$ **9.** $c^2d^2f - cd^2$ **10.** $\frac{5}{3}$ **11.** −1

12. $3x^3 + x^2y - 5xy^2 + 2y^3$ **13.** $N_R = 20$; $N_B = 50$ **14.** $N_W = 5$; $N_G = 1$ **15.** 24

16. A triangle which has sides all of different lengths **17.** $x = 145$; $y = 29$

18. $x = 120$; $y = 60$; $z = 60$ **19.** $A = 55$; $B = 14$; $C = 110$ **20.** 21 **21.** $4\sqrt{3}$ m

22. $\frac{175\pi}{18}$ m^2 **23.** 180π m^2

24. $V_{\text{cylinder}} = 128\pi$ m^3 = 402.12 m^3; $V_{\text{sphere}} = \frac{256\pi}{3}$ m^3 = 268.08 m^3 **25.** 12 cm

26. 2 cm **27.** $(80 + 12\pi)$ m^3 = 117.70 m^3

28. $V_{\text{cylinder}} = \left(\frac{1980 + 1125\pi}{2}\right)$ cm^3 = 2757.15 cm^3;

$A_{\text{surface}} = (508 + 260\pi)$ cm^2 = 1324.81 cm^2; $V_{\text{cone}} = \left(\frac{660 + 375\pi}{2}\right)$ cm^3 = 919.05 cm^3

29. A **30.** C

problem set 3

1. 20° **2.** 259 **3.** 700 **4.** $N_N = 21$; $N_D = 8$ **5.** Obtuse triangle

6. Right to left: $SF = 2$; Left to right: $SF = \frac{1}{2}$; $x = 8$; $y = \frac{7}{2}$ **7.** $x = \frac{45}{7}$; $y = \frac{35}{3}$

8. $x = 9$; $y = \frac{63}{5}$; $z = \frac{84}{5}$ **9.** $a = 12$; $b = 24$; $c = 15$

10. $x = \sqrt{70}$; $y = 3\sqrt{14}$; $z = 3\sqrt{5}$ **11.** $\frac{7p^7}{q^7}$ **12.** $\frac{6a^6}{b}$ **13.** $x = 3$; $y = 3$

14. $\frac{55}{36}$ **15.** $-\frac{4}{7}$ **16.** $\frac{6x^2 - 8x - 2}{x(x - 1)(x - 2)}$ **17.** $4x^5 - 3x^4 - 4x^3 + 8x^2 - 5$

18. $3 + \frac{8}{x^2y^6z^4}$ **19.** 24 **20.** $\frac{15}{2}$ **21.** $\frac{7\pi}{3}$ cm^2 **22.** 12π cm^2

23. $(4 - \pi)$ in.^{2} = 0.86 in.^{2} **24.** 4π in.^{2} **25.** $(48 + 4\pi)$ ft = 60.57 ft **26.** 6.9 cm^2

27. 3888π cm^3 **28.** 70 m^3 **29.** C **30.** A

problem set 4

1. 25° **2.** 1580 **3.** 825 **4.** $N_D = 11$; $N_Q = 9$ **5.** $N_O = 28$; $N_B = 16$

6. Obtuse triangle **7.** Refer to Lesson 4. **8.** Refer to Lesson 4.

9. Refer to Lesson 4. **10.** Refer to Lesson 4. **11.** Refer to Lesson 4.

12. $x = 10$; $y = 5$ **13.** $\frac{1}{15}$ **14.** $-\frac{32}{7}$ **15.** $\frac{-x^2 + 4x + 3}{x^2(x + 1)}$ **16.** $\frac{3s}{t^3} - 9s^7t$

17. $\frac{19}{2}$ **18.** $x = 9$; $y = \frac{20}{3}$ **19.** $a = 4$; $b = 10$; $c = 8$