

Answers for Self -Tests

Unit R

1. $2^2 \times 3^2$
2. a) Ten million, twenty-four thousand, five hundred twenty-six
b) Forty-seven and two hundred sixty-eight thousandths
3. a) 6.439
b) 8.025
c) 2.7
4. a) $\frac{30}{7}$
b) $1\frac{4}{5}$
5. $\frac{1}{4}$
6. 400
7. a) 0.45
b) 43.6%
c) $\frac{1}{4}$
d) 20%
e) $\frac{2}{5}$
f) $\frac{3}{10}$
8. a) 192
b) 105
9. a) $\frac{5}{6}$
b) $\frac{1}{2}$
c) $1\frac{5}{8}$
d) $\frac{2}{3}$
e) $6\frac{5}{7}$
f) $2\frac{1}{12}$
g) $1\frac{1}{4}$
h) 2
i) 12

- j) $\frac{1}{6}$
 k) $\frac{2}{3}$

Unit 1

1. 5
2. 9
3. a) 7
b) No mode.
4. a) 7
b) 8
5. a) 3
b) 1
c) 4
6. Let your instructor check your line graph.
7. Let your instructor check your circle graph.
8. a) 551
b) 311.64
c) 2839
d) $7\frac{31}{42}$
e) 248
9. a) 6,000,000
b) 570
c) 8,600
d) 48,000
10. a) 80,800
b) 9,600
c) 3,000,000
d) 20

Unit 2

1. a) Constant: -3 Coefficient: 2 Variable: x
 b) Constant: 13 Coefficient: -4 & $\frac{5}{7}$ Variable: t
2. a) $5x$, 3, $-y$
 b) $2r$, $16r^2$, $-\frac{3}{14}r$, 1
3. a) $-\frac{5}{9}x$ and $5x$, $2y^2$ and $13y^2$, 7 and -1
 b) $0.6t$ and $-7t$, $9uv$ and $1.67uv$

4. a) 76
b) 58
5. a) $10y$
b) $\frac{t}{6}$
c) $15 - (x + \frac{3}{7}) = 6$
d) $6x - 7 = 15$
6. a) $\$375 + y$
b) $175 - y$
c) $45 - w$
d) $\frac{x}{4}, \frac{x}{48}$
7. a) x
b) 4
8. a) $9 \cdot 9 \cdot 9$
b) $(-y)(-y)(-y)(-y)$
c) $(0.5a^3b)(0.5a^3b)$
d) $\frac{2}{7}x$
9. a) $(0.06)^4$
b) $(12y)^3$
c) $(\frac{-2}{9}x)^2$
10. 1440
11. a) y^8
b) 5^3
12. a) 8
b) 9
13. a) 133
b) 63
c) 8

Unit 3

1. 21 cm
2. 14.1 cm
3. a) 5.6 in
b) 11 ft
c) 35.2 cm
d) $\frac{18}{19}$ yd
4. 7.85 in

5. a) 33 cm
 b) 26.85 cm
 c) 17.85 in
 d) 22.6 yd
6. 17.8 in
7. 18 m
8. a. 50 m
 b. \$750
9. 36 m
10. a) 17.25cm^2
 b) 16.57 in^2
 c) 23.85 m^2
11. 47.47m^2
12. 281.2 m^2
13. a) 50.65 cm^3
 b) 45.144 mm^3
 c) 3591.1 cm^3
 d) 89.8 cm^3
 e) 217.68 cm^3
14. 14815.8 m^3
15. 301.6 m^3
16. No
17. 7263.4 cm^3
18. 98.8 cm^2
19. 32.74 in^2
20. $LA \approx 93.12\text{ yd}^2$, $SA \approx 135.59\text{ yd}^2$
21. $LA \approx 73.39\text{ cm}^2$, $SA \approx 105.56\text{ cm}^2$
22. 10.18 m^2
23. 1.72 m^2
24. 273.3 m^2

Unit 4

1. a) 0.439 m
 b) 223.6 g
 c) 0.0000483 kL
 d) 25 hg
2. a) 7.23 kg
 b) 520 mm

- c) 0.34 L
- d) 52000 cL
- 3. a) 4000 mm
- b) 63006 g
- c) 5290 mL
- d) 28.87 km
- 4. a) 0.74 m^2
- b) $90,000 \text{ m}^2$
- c) $5,000,000 \text{ cm}^3$
- d) 0.567 cm^3
- 5. a) 4
- b) 38 g
- c) 5000 cm^3
- d) 2.7 cL
- e) 76
- f) $18,000 \text{ cm}^3$
- g) 257 L
- h) 0.039375 kL
- 6. a) 108 in
- b) 94 pt
- c) 7040 yd
- d) 4.638 lb
- 7. a) 2.438 m
- b) 7.6 kg
- c) 93 tsp
- d) 9 mi
- e) 724.2 km

Unit 5

- 1. $\frac{1}{3}$, 7.3 (Answers may vary.)
- 2. a) 8
- b) -3, 0, 8
- c) -3, 0, 8, 4.7 , $\frac{3}{5}$, $2.\overline{56}$
- d) $5.4259\dots$, π , $\sqrt{5}$
- 3. a) Identity property of addition
- b) Commutative property of addition

- c) Associative property of addition
 - d) Inverse property of addition
 - e) Distributive property
 - f) Associative property of multiplication
 - g) Commutative property of multiplication
 - h) Inverse property of multiplication
 - i) Distributive property
 - j) Multiplicative property of zero
 - k) Commutative property of addition
 - l) Associative property of multiplication
4. a) $(12 + 88) + 45 = 145$
 b) $(9 \cdot 8) 1000 = 72,000$
 c) $(3 + 2997) + 56 = 3056$
5. a) $4y^2 + 1.2y$
 b) $10 - 15y^2$
 c) $\frac{2}{9} - \frac{1}{6}x$
6. a) $6 < 8$
 b) $0 > -6$
 c) $-4 < -2$
 d) $-\frac{3}{7} < \frac{1}{7}$
 e) $-0.6 > -0.8$
 f) $1\frac{1}{2} > \frac{3}{8}$
7. a) $-17 < -9 < -4 < 0 < 8 < 23$
 b) $-8 < -3.24 < 0.05 < \frac{2}{5} < \frac{3}{5}$
 c) $-\frac{1}{3} < -\frac{1}{7} < \frac{2}{5} < 1\frac{3}{4}$
8. a) 67
 b) 21
 c) 0.45
 d) -49
 e) $\frac{1}{8}$
9. a) 116
 b) 25
10. a) 37
 b) -15
 c) $-2\frac{3}{5}$

- 11.

Unit 6

- 2.

6.
 - a) $10a^2 + 13$
 - b) $-19x + 39y$
 - c) $7z^2 - 16z + 31$
 - d) $-20y^2 + 47y - 33$
 - e) $17ab - 28xy$
7.
 - a) a^9
 - b) $\frac{1}{x^{11}}$
 - c) $\frac{1}{t^6}$
 - d) $-42a^7 b^{11}$
 - e) $\frac{1}{4}x^4 y^7 z^9$
 - f) $\frac{1}{6}y^5$
 - g) $\frac{-9}{m}$
8.
 - a) $-12x^7 + 28x^4$
 - b) $27a^4b^3 + 18a^5b^3 - 9a^4b$
 - c) $7a + 1 - \frac{4}{5a}$
 - d) $40y^2 - 11y - 63$
 - e) $21r^2 + 28rt^2 - 6rt - 8t^3$
 - f) $10a^3 b^3 + 21a^2b^2 + 9ab$
 - g) $x^2 - x + \frac{2}{9}$

Unit 7

1.
 - a) Yes
 - b) No
 - c) Yes
2.
 - a) $x = 19$
 - b) $y = \frac{1}{4}$
 - c) $m = 23$
 - d) $t = 8$
 - e) $x = \frac{3}{8}$
 - f) $y = -52$
 - g) $x = 28$
 - h) $y = -\frac{7}{9}$
 - i) $x = 7$
 - j) $t = -2$

- k) $y = -0.8$
 l) $y = 7\frac{8}{9}$
 3. a) $t = \frac{3}{14}$
 b) $m = 9$
 c) $x = 2$
 d) $y = \frac{1}{2}$
 e) $x \approx 0.069$
 f) $t = -0.05$
 g) $x = -\frac{4}{5}$
 4. a) Contradiction equation
 b) Identity equation
 c) Conditional equation
 d) Contradiction equation
 e) Conditional equation
 f) Identity equation
 5. a) $(x - 7) + 9$
 b) $\frac{7}{9x}$
 c) $11x - 8$
 6. a) $4xy - 13 = x + y + 6$
 b) $x^2 + y^2 = xy - 26$
 c) $5 + \frac{5x}{23} = 11x$
 d) $(x + 1) - x = 1$
 e) $x + (x + 2) + (x + 4) = 15$
 f) $x(x + 2) = 48$
 g) $x + (x + 2) + (x + 4) = 21$
 7. a) $7x = 42$, $x = 6$
 b) $4x - 3 = \frac{x}{4} - 9$, $x = -1.6$
 c) $(5x - 3) + x + (4 + 5x - 3) = 20$, 2, 7, 11
 d) $x + (x + 2) + (x + 4) = 27$, 7, 9, 11
 e) $x + 7x + (30 + 7x) = 180^0$, 10^0 , 70^0 , 100^0
 f) $128 = 2(l - 8) + 2l$, 36m, 28m
 g) $x = 199.99 + 20\% x$, $x = \$249.99$
 h) $x = 379.99 - (10\%)(379.99)$, $x = \$341.99$

Unit 8

1. 121.43

2. 195 km
3. 2 h
4. 186.13
5. $A = 385 \text{ cm}^2$, $P = 92 \text{ cm}$
6. 696 ft^2
7. $C = 15.08 \text{ ft}$, $A = 18.1 \text{ ft}^2$
8. \$337.50
9. 18¢
10. a) $r = \frac{d}{t}$
 b) $t = \frac{I}{P r}$
 c) $l = \frac{p-2w}{2}$
 d) $F = \frac{9}{5}C + 32$, 75.2
 e) $m = \frac{p-C}{C}$
 f) $z = \frac{x-35y^2}{y}$
 g) $b = \frac{2A}{h^2}$
 h) $z = y - x t$
 i) $h = \frac{35w}{\pi h^2}$
 j) $w = \frac{y-x}{2z+3}$, 0.091
11. 20.86 cm
12. 0.946 m
13. 14.91 ft
14. 283.65 km
15. 68.35 ft

Unit 9

1. a) $\frac{1}{3}$
 b) $\frac{3}{11}$
 c) $\frac{7 \text{ people}}{30 \text{ tickets}}$
 d) $\frac{11}{31}$
 e) $\frac{8 \text{ km}}{37 \text{ min}}$
2. 0.14%
3. 1.25%

4. 76.5 km/h
5. 4 L
6. 8-lb.
7. a) $\frac{5}{110} = \frac{15}{330}$
b) $\frac{24}{1970} = \frac{12}{985}$
8. \$3.69
9. 16 ft
10. \$18,000
11. 117
12. 300
13. 40%
14. 20.1%
15. a) 3 cm
b) 11.2 m
c) 5.25 cm

Unit 10

1. a) Acute angles
b) Obtuse angles
c) Obtuse angle
d) Reflex angle
2. 48°
3. 34°
4. 44°
5. a) Supplementary
b) $\angle A = 147^\circ$, $\angle B = 33^\circ$
6. $\angle C = 40^\circ$
7. $\angle C = 72^\circ$, $\angle D = 108^\circ$, $b = 5$ cm
8. a) vi b) i c) iii d) ii
9. a) $\angle \theta = 60^\circ$, $x = 23$ cm It is an equilateral triangle (an acute triangle).
b) $\angle B = 102^\circ$, $a = 43$ ft It is an isosceles triangle (an obtuse triangle).
c) $\angle B = \angle C = 28^\circ$, It is an isosceles triangle (an obtuse triangle).
d) $\angle Z = 72^\circ$ opposite $^\circ$, $x = 32$ cm It is an isosceles triangle (an acute triangle).
10. a) opposite
b) adjacent
c) hypotenuse

- d) adjacent
e) opposite
f) Y
11. $\sin X = \frac{5 \text{ cm}}{7.81 \text{ cm}} \approx 0.6402$, $\sin Z = \frac{6 \text{ cm}}{7.81 \text{ cm}} \approx 0.7682$
 $\cos X = \frac{6 \text{ cm}}{7.81 \text{ cm}} \approx 0.7682$, $\cos Z = \frac{5 \text{ cm}}{7.81 \text{ cm}} \approx 0.6402$
 $\tan X = \frac{5 \text{ cm}}{6 \text{ cm}} \approx 0.8333$, $\tan Z = \frac{6 \text{ cm}}{5 \text{ cm}} = 1.2$
12. $\sin O = \frac{4.25 \text{ ft}}{7.62 \text{ ft}} \approx 0.5577$, $\sin Q = \frac{6.32 \text{ ft}}{7.62 \text{ ft}} \approx 0.8294$
 $\cos O = \frac{6.32 \text{ ft}}{7.62 \text{ ft}} \approx 0.8294$, $\cos Q = \frac{4.25 \text{ ft}}{7.62 \text{ ft}} \approx 0.5577$
 $\tan O = \frac{4.25 \text{ ft}}{6.32 \text{ ft}} \approx 0.6725$, $\tan Q = \frac{6.32 \text{ ft}}{4.25 \text{ ft}} \approx 1.4871$
13. a) 0.8387
b) 0.8090
c) 19.0811
d) 12.5°
e) 62.83°
f) 51.02°
14. $x \approx 7.793$
15. $c = 36.58 \text{ cm}$
16. $\angle A = 51^\circ$, $b \approx 4.86 \text{ m}$, $c \approx 7.72 \text{ m}$
17. a) $b \approx 6.25 \text{ cm}$
b) $\angle A = 41^\circ$
18. a) $\angle B = 45^\circ$, $b = 6 \text{ m}$, $c \approx 8.458 \text{ m}$
b) $a = 4 \text{ ft}$, $\angle A \approx 53.13^\circ$, $\angle B = 36.87^\circ$
19. a) $\angle B \approx 32^\circ$
b) $y \approx 16.04 \text{ m}$
20. $x \approx 25.74 \text{ m}$
21. $\angle \theta \approx 41.21^\circ$
22. $x \approx 22.67 \text{ m}$
23. $\angle \theta \approx 49.09^\circ$
24. $x \approx 47.34 \text{ cm}$

Unit 11

1. a) $7 \cdot 7 \cdot 7 \cdot 7$
b) $(-t)(-t)(-t)$
c) $(5a^4b^0)(5a^4b^0)$
d) $\left(\frac{-7}{11}x\right)\left(\frac{-7}{11}x\right)\left(\frac{-7}{11}x\right)$

2.
 - a) $(0.5)^4$
 - b) $(6w)^3$
 - c) $42 u^2 v^2$
3.
 - a) 24
 - b) 982
4.
 - a) 5
 - b) 7
5.
 - a) $9x^4 - 7x^3 + x^2 - x + 2$
 - b) $21uv^3 - uv^2 + 4v - 67$
6.
 - a) $43 - 5x + 26x^2 - 17x^3$
 - b) $-9 + \frac{4}{7}tw + 4.3t^2w^2 - 8w^3 + w^4$
7.
 - a) - 92
 - b) 1
 - c) - 0.064
 - d) - 64
 - e) y^7
 - f) x^3
 - g) $\frac{1}{t^{20}}$
 - h) $\frac{13}{a}$
 - i) - 0.512
 - j) $81a^8 b^{12}$
 - k) 64
 - l) $\frac{u^3}{w^3}$
 - m) $a^6 b^8$
 - n) 1
 - o) $\frac{5x^2}{y^{10}}$
 - p) $\frac{u^6}{w^{12} v^9}$
 - q) $72 x^4 y^5$
 - r) $\frac{27}{64} x^3 y^3$
8.
 - a) 1
 - b) $\frac{8}{27}$
 - c) 9
9.
 - a) 4.56×10^7
 - b) 5.23×10^{-6}

10. a) 3578
 b) 0.000043
11. a) 2.37396×10^6
 b) 3.75×10^{-6}
12. a) 14
 b) $\frac{11}{15}$
 c) $8\sqrt{5}$
 d) $\frac{\sqrt{13}}{3}$

Unit 12

1. 3, 17, 1
2. 2, 7, 14
3. 234.55 g, 625.45g
4. 6.3 L
5. 13 km/h
6. 0.2 h, 0.286 h
7. 5%
8. 22.5%
9. \$61.11
10. \$27,960
11. \$29.85, \$169.15
12. \$23,450, \$445,550
13. \$20,000, \$120,000
14. \$ 2662.56
15. \$ 41.05
16. \$33170.73
17. \$3500, \$2000
18. 3, 9, 10, 30
19. 1.2 L

Unit 13

1. a) 12
 b) 9
 c) 8
2. a) $-8y$

- b) $\frac{5}{8}x$
 c) $-9xy^2 + 4x^2 - y^3$
3. $9x^4 - x^3 - 8x + 10$
4. $4x^2 + 7x - 18$
5. a) $11a^3 - 4a^2 + 9a + 2$
 b) $5x^2 - 4x + 11$
6. a) $24x^7y^5$
 b) $12a^6 - 24a^3$
 c) $14x^2y^6 + 7x^4y^3 - 21xy^3$
 d) $12x^2 - 31x + 20$
 e) $-2a^4 + a^3 + 13a^2 - 15a$
7. a) $8t^7 - 20t^4$
 b) $3x^2 - 17x + 10$
 c) $36a^2 - 25$
 d) $9w^2 - 6w + 1$
 e) $25u^2 + 5u + \frac{1}{4}$
 f) $36x^2 - 4xy + \frac{1}{9}y^2$
 g) $\frac{1}{25}z^2 - \frac{1}{16}$
8. a) $56x^3$
 b) $-9\left(\frac{a^2}{b^3}\right)$
 c) $4y + 1 - \frac{3}{7y}$
 d) $3(2a + 1)$
9. a) $3x + 2$, Remainder = 2
 b) $2x^2 - 7x + 14$, Remainder = 2

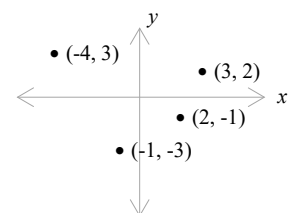
Unit 14

1. $2 \cdot 2 \cdot 3 \cdot 5$
2. a) $5x$
 b) $3ab$
 c) $y + 4$
 d) $\frac{1}{4}x$
 e) $-4y$
3. a) $(5x - 1)(5x + 4)$
 b) $(6b - a)(8ab + 1)$

- c) $25uv - 6vw$
 - d) $(x + y)(x - y)^2$
 - e) $5(y + 2)(y - 2)$
 - f) $(1 + 7w)(1 - 7w)$
 - g) $(9u + 11)(9u - 11)$
 - h) $(5a + 6b)(5a - 6b)$
 - i) $(2y^3 + 0.3)(2y^3 - 0.3)$
4. a) $(x + 4)(x + 5)$
 b) $(x - 4)(x - 6)$
 c) $(x + 3)(x - 6)$
 d) $2(x - 2)(x + 7)$
 e) $(x - 3)(4x + 5)$
 f) $(5y - 6)(y + 3)$
 g) $(6b - a)(4ab + 1)$
 h) $17uv - 6vs$
5. a) $3(2x + 5)(x - 4) = 0$
 b) $2(3x - 4)(x + 2)$
6. a) $(3x + 5)^2$
 b) $3(2y - 3)^2$
 c) $2(3t^4 - 2)^2$
7. a) $0, -\frac{7}{23}$
 b) $\pm \frac{7}{9}$
 c) $-9, 17$
8. a) $-6, 7$
 b) $-\frac{4}{7}, 5$
 c) $\frac{1}{4}, \frac{3}{4}$
9. $-9,$
10. $4, -6$
11. $7m, 9m$
12. $6m, 8m$

Unit 15

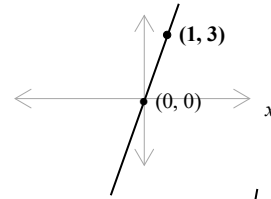
1. $(2, -1)$: IV, $(-4, 3)$: II, $(-1, -3)$: III, $(3, 2)$: I



2.

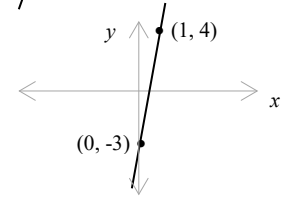
a)

x	$y = 3x$	(x, y)
0	0	(0, 0)
1	3	(1, 3)



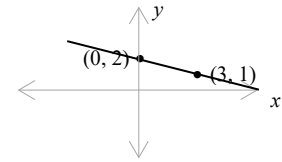
b)

x	$y = 7x - 3$	(x, y)
0	-3	(0, -3)
1	4	(1, 4)



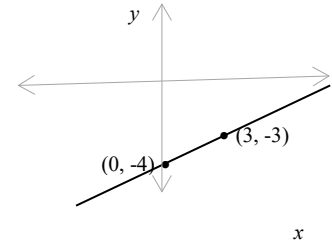
c)

x	$y = -\frac{1}{3}x + 2$	(x, y)
0	2	(0, 2)
3	1	(3, 1)



3.

x	$y = \frac{1}{3}x - 4$	(x, y)
0	-4	(0, -4)
3	-3	(3, -3)



Third point may vary.

4.

a) $y = -1$

b) $y = -5$

c) $y = -2$

5.

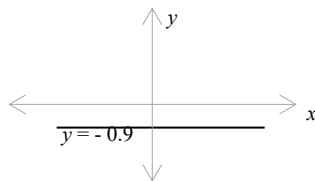
$m = -6$

6.

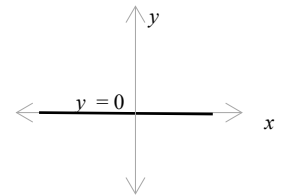
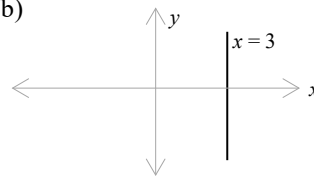
$m = 8$

7.

a)



b)



8.

a) $m = -7$

$b = -11$ or $(0, -11)$

b) $m = \frac{3}{5}$

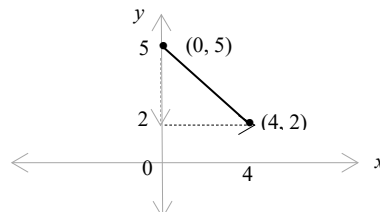
$b = \frac{2}{5}$ or $(0, \frac{2}{5})$

c) $m = -35$

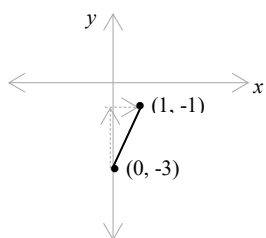
$b = 10$ or $(0, 10)$

9.

a)



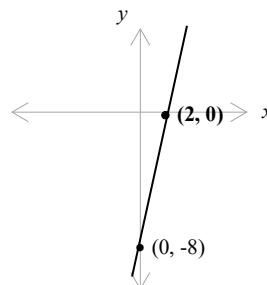
b)



10. $(3, 0), (0, -9).$

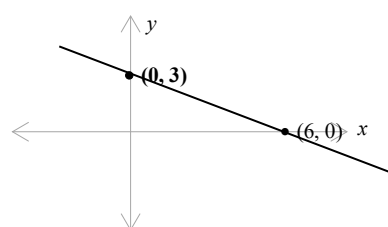
11. a)

x	$y = 4x - 8$	(x, y)
0	-8	$(0, -8)$
2	0	$(2, 0)$

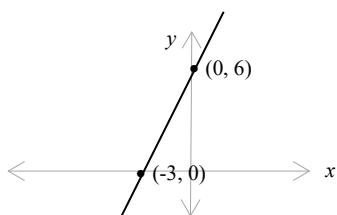


b)

x	$y = -\frac{1}{2}x + 3$	(x, y)
0	3	$(0, 3)$
6	0	$(6, 0)$

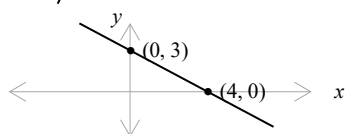


12. a)



$$y = 2x + 6$$

b)



$$y = -\frac{3}{4}x + 3$$

13. a) $y = -4x - 3$

b) $y = \frac{3}{5}x - 10$

14. a) $y = -9x + 29$

b) $y = 2x + 6$

c) $y = -\frac{2}{5}x + 5$