

Math 9 Midyear Review Answers

Lesson 1.1

1. a) $\frac{1}{3}$ b) 0.4
3. a) $\frac{25}{49}$ b) 2.56
 c) 0.8464 d) $\frac{100}{81}$
4. a) $\frac{15}{7}$ b) $\frac{3}{5}$
 c) $\frac{20}{18}$, or $\frac{10}{9}$
 d) $\sqrt{\frac{8}{98}} = \sqrt{\frac{4}{49}} = \frac{2}{7}$
5. a) 2.6 b) 18.1
 c) 0.05 d) 0.15

Lesson 1.2

1. a) No, 53 is not a perfect square.
 b) Yes, both 1 and 25 are perfect squares.
 c) No, $\sqrt{0.009} = \sqrt{\frac{9}{1000}}$, and 1000 is not a perfect square.
 d) Yes, $\sqrt{10.24} = \sqrt{\frac{1024}{100}}$ and both 1024 and 100 are perfect squares.
3. a) $\sqrt{11.6}$ is between $\sqrt{9} = 3$ and $\sqrt{16} = 4$, but closer to 3. Try 3.4: $3.4^2 = 11.56$. So, $\sqrt{11.6} \doteq 3.4$
 b) $\sqrt{0.39} \doteq \sqrt{0.36} = \sqrt{\frac{36}{100}} = \frac{6}{10} = 0.6$
 c) $\sqrt{\frac{21}{2}} = \sqrt{10.5}$ and $\sqrt{10.5}$ is between $\sqrt{9} = 3$ and $\sqrt{16} = 4$, but closer to 3. Try 3.2: $3.2^2 = 10.24$, which is close. So, $\sqrt{\frac{21}{2}} \doteq 3.2$
 d) $\sqrt{\frac{11}{52}} \doteq \sqrt{\frac{13}{52}} = \sqrt{\frac{1}{4}}$, which is $\frac{1}{2}$. So, $\sqrt{\frac{11}{52}} \doteq 0.5$
6. a) 17 cm b) 7.1 m

Lesson 1.3

1. c) 36 unit^2 d) 30 unit^2

Lesson 1.4

1. a) 996 cm^2 b) 4200.4 cm^2
 2. 162 m^2

Lesson 2.1

1. a) 6 b) 2 c) -5 d) 7
 2. $3^5 = 3 \times 3 \times 3 \times 3 \times 3 = 243$ and $5^3 = 5 \times 5 \times 5 = 125$
 3.

Power	Base	Exponent	Repeated Multiplication	Standard Form
4^4	4	4	$4 \times 4 \times 4 \times 4$	256
$(-10)^3$	-10	3	$(-10)(-10)(-10)$	-1000
$(-6)^2$	-6	2	$(-6)(-6)$	36
1^5	1	5	$1 \times 1 \times 1 \times 1 \times 1$	1

4. a) $6^2 = 36$ b) $3^6 = 729$
 c) $10^4 = 10\,000$
 d) $-8^3 = -512$ e) $(-8)^3 = -512$
 f) $-(-8)^3 = 512$
5. a) $7 \times 7 \times 7 \times 7 \times 7 = 16\,807$
 b) $4 \times 4 \times 4 \times 4 \times 4 \times 4 = 4096$
 c) $-9 \times 9 \times 9 = -729$
 d) $(-5)(-5)(-5)(-5)(-5) = -3125$
7. a) $(-3)^2$ is positive because the answer is the product of an even number of negative integers: 9
 b) $(-3)^3$ is negative because the answer is the product of an odd number of negative integers: -27
 c) -3^2 is negative because the answer is the opposite of the product of an even number of positive integers: -9
 d) $-(-3)^3$ is positive because the answer is the opposite of the product of an odd number of negative integers: 27

Lesson 2.2

1. a) 1 b) 1 c) 1
 d) 1 e) -1 f) 1

3. a) 7×10^{11} b) 7×10^3
 c) $(7 \times 10^4) + (7 \times 10^3) + (7 \times 10^1) + (7 \times 10^0)$
 d) $(7 \times 10^6) + (7 \times 10^0)$

4. c) 2206 d) 400 530 008

Lesson 2.3

1. e) 64 f) 4
 g) 34 h) 16

2. e) 512 f) 8 g) 512 h) 8

3. d) 80 000 e) 256 f) 1

Lesson 2.4

1. d) -6^4 e) $(-7)^2$ f) $(-9)^9$
 2. d) -3^0 e) $(-9)^5$ f) 11^3
 3. a) 2^0 b) $(-5)^7$ c) 6^2

4. a) 10 b) -6 c) -24

5. a) $4^3 \div 4^2 + 2^4 \times 3^2 = 4 + 16 \times 9 = 148$
 b) $3^2 + 4^2 \times 4^1 \div 2^3 = 9 + 64 \div 8 = 17$

c) $\frac{3^4}{3^3} + \frac{4^2 \times 4^0}{2^4} = 3 + \frac{16}{16} = 3 + 1 = 4$

Lesson 2.5

1. a) $3^4 \times 2^4$ b) $(-4)^2 \times 3^2$
 c) $(-2)^3 \times (-4)^3$ d) $7^0 \times 11^0$
 e) $10^3 \div 5^3$ f) $(-12)^2 \div (-6)^2$
 g) $\frac{8^4}{4^4}$ h) $\frac{1^6}{10^6}$

2. a) 3^8 b) 5^0
 c) -7^4 d) $(-3)^6$

4. a) $(2^3 \times 2^1)^2 = (2^4)^2 = 2^8 = 256$
 b) $(5^4 \div 5^2)^2 = (5^2)^2 = 5^4 = 625$
 c) $[(-3)^0 \times (-3)^3]^2 = [(-3)^3]^2 = (-3)^6 = 729$
 d) $(10^2)^4 \div (10^3)^2 = 10^8 \div 10^6 = 10^2 = 100$

5. a) $(3^2 \times 4^3)^2 - (4^4 \div 4^2)^2 = (9 \times 64)^2 - (4^2)^2 = 576^2 - 4^4 = 331\,776 - 256 = 331\,520$
 b) $(2^3 \div 2^2)^3 + (7^4 \times 7^3)^0 = 2^3 + 1 = 8 + 1 = 9$

c) $[(-1)^3]^4 - [(-1)^4 \div (-1)^3]^2 = (-1)^{12} - (-1)^2 = 1 - 1 = 0$

d) $(4^2 \times 4^3)^0 - (3^2)^2 = 1 - 3^4 = 1 - 81 = -80$

e) $(5^2 \times 5^0)^3 + (2^5 \div 2^3)^3 = 5^6 + 2^6 = 15\,625 + 64 = 15\,689$

f) $(10^6 \div 10^3)^2 + (2^3 \div 2^1)^4 = (10^3)^2 + (2^2)^4 = 10^6 + 2^8 = 1\,000\,000 + 256 = 1\,000\,256$

Lesson 3.1

5. a) -7.2 is greater because it is to the right of -7.3 on a number line.
 b) $\frac{5}{4}$ is greater because it is greater than 1 whereas $\frac{4}{5}$ is less than 1.
 c) 1.2 is greater since it is positive.
 d) One-eleventh is greater than one-thirteenth. So, $-\frac{10}{13}$ is closer to 0 than $-\frac{10}{11}$ on a number line. Since both numbers are negative, the number closer to 0, or farther to the right, is greater. So, $-\frac{10}{13}$ is greater.

Lesson 3.2

1. b) $-19.3 + (-2.4) = -21.7$
 2. c) $\frac{3}{4} + \left(-\frac{1}{2}\right) = \frac{3}{4} + \left(-\frac{2}{4}\right) = \frac{3-2}{4} = \frac{1}{4}$
 d) $-\frac{3}{4} + \left(-\frac{1}{2}\right) = -\frac{3}{4} + \left(-\frac{2}{4}\right) = \frac{-3-2}{4} = \frac{-5}{4} = -1\frac{1}{4}$

3. a) $-40.25 + 17.50 = -22.75$
 b) Sarah now owes \$22.75.

4. a) $2\frac{2}{5} + \left(-4\frac{1}{2}\right) = \frac{12}{5} + \left(-\frac{9}{2}\right) = \frac{24}{10} + \left(-\frac{45}{10}\right) = \frac{24-45}{10} = \frac{-21}{10} = -2\frac{1}{10}$

b) $-6\frac{3}{8} + \left(-1\frac{1}{5}\right) = -\frac{51}{8} + \left(-\frac{6}{5}\right) = -\frac{255}{40} + \left(-\frac{48}{40}\right) = \frac{-255-48}{40} = \frac{-303}{40} = -7\frac{23}{40}$

5. Estimates may vary.

c) -3.55

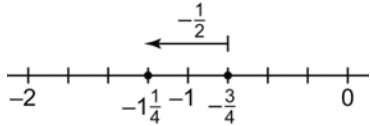
d) -7.38

Lesson 3.3

1. b) $-1\frac{1}{2} - \frac{3}{4} = -2\frac{1}{4}$

2. a) I sketched a number line.

$$-\frac{3}{4} - \frac{1}{2} = -1\frac{1}{4}$$



b) I used common denominators.

$$\begin{aligned} 3\frac{3}{5} - \left(-5\frac{1}{2}\right) &= \frac{18}{5} - \left(-\frac{11}{2}\right) = \frac{36}{10} - \left(-\frac{55}{10}\right) \\ &= \frac{36 - (-55)}{10} = \frac{36 + 55}{10} = \frac{91}{10} = 9\frac{1}{10} \end{aligned}$$

3. $20.4 - (-35.4) = 55.8$; the distance between the climbers is 55.8 m.

4. a) Negative

$$\begin{aligned} 3\frac{2}{7} - 4\frac{3}{5} &= \frac{23}{7} - \frac{23}{5} = \frac{115}{35} - \frac{161}{35} \\ &= \frac{115 - 161}{35} = -\frac{46}{35} = -1\frac{11}{35} \end{aligned}$$

b) Positive

$$\begin{aligned} 3\frac{1}{4} - \left(-2\frac{2}{3}\right) &= \frac{13}{4} - \left(-\frac{8}{3}\right) = \frac{39}{12} - \left(-\frac{32}{12}\right) \\ &= \frac{39 - (-32)}{12} = \frac{39 + 32}{12} = \frac{71}{12} = 5\frac{11}{12} \end{aligned}$$

Lesson 3.4

1. c) Positive

$$(-0.6) \times (-0.15) = 0.09$$

d) Negative

$$0.9 \times (-1.2) = -1.08$$

2. a) Negative

$$\frac{2}{5} \times \left(-\frac{1}{2}\right) = -\frac{1}{5}$$

b) Negative

$$\left(-\frac{3}{2}\right) \times \frac{1}{7} = -\frac{3}{14}$$

c) Positive

$$\left(-\frac{3}{4}\right) \times \left(-\frac{4}{5}\right) = \frac{3}{5}$$

3. $11.4 + [9 \times (-1.7)] = -3.9$

It was -3.9°C on the morning of Nov. 21.

4. a) Estimate: $(1)(-13) = -13$

$$\text{Calculate: } (1.19)(-13.2) = -15.708$$

b) Estimate: $(-9)(-2) = 18$

$$\text{Calculate: } (-8.65)(-1.6) = 13.84$$

5. a) $\left(\frac{10}{7}\right)\left(-\frac{13}{8}\right) = \left(-\frac{130}{56}\right) = -\frac{65}{28} = -2\frac{9}{28}$

b) $\left(-4\frac{3}{5}\right)\left(-2\frac{5}{12}\right) = \left(-\frac{23}{5}\right)\left(-\frac{29}{12}\right) = \frac{667}{60} = 11\frac{7}{60}$

Lesson 3.5

1. b) i) 20

ii) 0.2

2. c) Positive

$$\left(-\frac{3}{4}\right) \div \left(-\frac{5}{2}\right) = -\frac{3}{4} \times \left(-\frac{4}{10}\right) = \frac{-3}{-10} = \frac{3}{10}$$

d) Negative

$$\frac{5}{9} \div \left(-\frac{2}{3}\right) = \frac{5}{9} \times \left(-\frac{3}{2}\right) = -\frac{15}{18} = -\frac{5}{6}$$

5. a) $3\frac{1}{2} \div \left(-2\frac{1}{6}\right) = \frac{7}{2} \div \left(-\frac{13}{6}\right)$

$$= \frac{21}{6} \div \left(-\frac{13}{6}\right) = -\frac{21}{13} = -1\frac{8}{13}$$

b) $\left(-2\frac{1}{5}\right) \div \left(-4\frac{3}{4}\right) = \left(-\frac{11}{5}\right) \div \left(-\frac{19}{4}\right)$

$$= \left(-\frac{11}{5}\right) \times \left(-\frac{4}{19}\right) = \frac{44}{95}$$

Lesson 3.6

1. a) $4.5 + 5.1 \div 1.7 = 4.5 + 3 = 7.5$

b) $-5.8 - 3.1 \times 0.5 = -5.8 - 1.55 = -7.35$

4. a) $-4\frac{2}{3} \div \left[\left(-\frac{1}{3}\right) + 4\frac{1}{6}\right] + \left(-3\frac{2}{5}\right)$

$$= -\frac{14}{3} \div \left[\left(-\frac{1}{3}\right) + \frac{25}{6}\right] + \left(-\frac{17}{5}\right)$$

$$= -\frac{14}{3} \div \left[\left(-\frac{2}{6}\right) + \frac{25}{6}\right] + \left(-\frac{17}{5}\right)$$

$$= -\frac{14}{3} \div \frac{23}{6} + \left(-\frac{17}{5}\right)$$

$$= -\frac{28}{6} \div \frac{23}{6} + \left(-\frac{17}{5}\right)$$

$$= -\frac{28}{23} + \left(-\frac{17}{5}\right) = -\frac{531}{115} = -4\frac{71}{115}$$

