حل أسئلة تغطية اختبار نهاية الفصل





تم تحميل هذا الملف من موقع المناهج الإماراتية

موقع المناهج ⇦ المناهج الإماراتية ⇦ رياضيات ⇦ الفصل الأول ⇦ ملفات متنوعة ⇦ الملف

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المزيد من مادة رياضيات:	ملفات ا كتب للمعلم ا كتب للطالب ا اختبارات الكترونية ا اختبارات ا حلول ا عروض بوربوينت ا أوراق عمل منهج انجليزي ا ملخصات وتقارير ا مذكرات وبنوك ا الامتحان النهائي ا للمدرس
	إعداد: Boys C2 - School Sedeirah Al

التواصل الاجتماعي بحسب

صفحة المناهج الإماراتية على فيسبوك					
المواد على تلغرام	التربية الاسلامية	اللغة العربية	اللغة الانجليزية	الرياضيات	

المزيد من الملفات بحسب والمادة رياضيات في الفصل الأول

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Al Sedeirah School - C2 Boys

Grade 8 Adv Term 1 Exam Coverage

Answer Key with Explanations

Teacher's note: The numbers follow the textbook exercise numbers used in the practice paper. Each solution is worked out line by line, as done in class. Calculators are not used.

SECTION A — MULTIPLE CHOICE ANSWERS (Q1 – Q20)

Q1 | Lesson 1-1: Powers and Exponents **Textbook p. 11**

1. Answer: C) $(-7)^2 \cdot 5^4$

$$\text{two factors of } (-7) \to (-7)^2$$
$$\text{four factors of } 5 \to 5^4$$
$$(-7) \cdot (-7) \cdot 5 \cdot 5 \cdot 5 \cdot 5 = (-7)^2 \cdot 5^4$$

---

2. Answer: A) $n^2p^2r^3$

$$n \cdot n = n^2, \quad p \cdot p = p^2, \quad r \cdot r \cdot r = r^3$$
$$n \cdot n \cdot p \cdot p \cdot r \cdot r \cdot r = n^2p^2r^3$$

---

3. Answer: D) 65

$$3^4 = 3 \cdot 3 \cdot 3 \cdot 3 = 81$$
$$(-4)^2 = (-4)(-4) = 16$$
$$3^4 - (-4)^2 = 81 - 16 = 65$$

---

4. Answer: B) 70

$$2^6 = 64$$
$$6 + 2^6 = 6 + 64 = 70$$

---

5. Answer: A) $\frac{119}{16}$

$$x^3 - y^2 = 2^3 - \left(\frac{3}{4}\right)^2$$
$$= 8 - \frac{9}{16} = \frac{128}{16} - \frac{9}{16} = \frac{119}{16}$$

---

6. Answer: C) -1

$$g + h = 2 + (-3) = -1$$
$$(g + h)^3 = (-1)^3 = -1$$

Q2 | Lesson 1-2: Multiply and Divide Monomials — Textbook p. 23

1. Answer: B) 3^9

$$3^8 \cdot 3^1 = 3^{8+1} = 3^9$$

---

2. Answer: D) m^7

$$m^5 \cdot m^2 = m^{5+2} = m^7$$

---

3. Answer: D) $24m^4n^5$

$$3 \cdot 8 = 24, \quad m^3 \cdot m = m^4, \quad n^2 \cdot n^3 = n^5$$
$$3m^3n^2 \cdot 8mn^3 = 24m^4n^5$$

---

4. Answer: B) $-72p^6$

$$9 \cdot (-8) = -72, \quad p^4 \cdot p^2 = p^6$$
$$9p^4 \cdot (-8p^2) = -72p^6$$

---

5. Answer: C) b^7

$$\frac{b^{12}}{b^5} = b^{12-5} = b^7$$

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6. Answer: A) $5^2 \cdot 6^2 \cdot 8$

$$5^{5-3} = 5^2, \quad 6^{3-1} = 6^2, \quad 8^{10-9} = 8^1$$
$$\frac{5^5 \cdot 6^3 \cdot 8^{10}}{5^3 \cdot 6 \cdot 8^9} = 5^2 \cdot 6^2 \cdot 8$$

Q3 | Lesson 1-3: Powers of Monomials — Textbook p. 31

1. Answer: C) 7^6

$$(7^2)^3 = 7^{2 \cdot 3} = 7^6$$

---

2. Answer: A) 8^9

$$(8^3)^3 = 8^{3 \cdot 3} = 8^9$$

---

3. Answer: D) d^{42}

$$(d^7)^6 = d^{7 \cdot 6} = d^{42}$$

---

4. Answer: B) z^{21}

$$(z^7)^3 = z^{7 \cdot 3} = z^{21}$$

---

5. Answer: A) $64m^{30}$

$$(2m^5)^6 = 2^6 \cdot m^{5 \cdot 6}$$
$$= 64m^{30}$$

---

6. Answer: C) $2401a^{20}b^{24}$

$$(7a^5b^6)^4 = 7^4 \cdot a^{5 \cdot 4} \cdot b^{6 \cdot 4}$$
$$7^4 = 7 \cdot 7 \cdot 7 \cdot 7 = 2401$$
$$= 2401a^{20}b^{24}$$

---

7. Answer: B) $-243w^{15}z^{40}$

$$(-3w^3z^8)^5 = (-3)^5 \cdot w^{15} \cdot z^{40}$$
$$(-3)^5 = -243$$
$$= -243w^{15}z^{40}$$

---

8. Answer: D) $625r^{16}s^{40}$

$$(-5r^4s^{10})^4 = (-5)^4 \cdot r^{16} \cdot s^{40}$$
$$(-5)^4 = 625$$
$$= 625r^{16}s^{40}$$

Q4 | Lesson 1-5: Scientific Notation — Textbook p. 53

5. Answer: D) 2.204×10^9

Move the decimal point 9 places to the left to get a number between 1 and 10: 2.204

$2{,}204{,}000{,}000 = 2.204 \times 10^9$

---

6. Answer: B) 6.42×10^{-8}

Move the decimal point 8 places to the right to get a number between 1 and 10: 6.42

$0.0000000642 = 6.42 \times 10^{-8}$

Q5 | Lesson 1-6: Compute with Scientific Notation — Textbook p. 61

1. Answer: C) 3×10^{22}

$$100 \text{ billion} = 100{,}000{,}000{,}000 = 10^{11}$$
$$(3 \times 10^{11}) \times 10^{11} = 3 \times 10^{11+11} = 3 \times 10^{22}$$

---

2. Answer: A) 3.66×10^7

$$80{,}000 = 8 \times 10^4$$
$$\frac{8 \times 10^4}{2.1875 \times 10^{-3}} = \frac{8}{2.1875} \times 10^{4-(-3)}$$
$$\frac{8}{2.1875} \approx 3.66 \;\Rightarrow\; 3.66 \times 10^7$$

---

3. Answer: C) 1.2913×10^5

$1.13 \times 10^3 = 0.0113 \times 10^5$
same power of 10, so add the numbers: $1.28 + 0.0113 = 1.2913$
$(1.28 \times 10^5) + (1.13 \times 10^3) = 1.2913 \times 10^5$

---

4. Answer: A) 7.247×10^6

$1.3 \times 10^4 = 0.013 \times 10^6$
same power of 10, so subtract: $7.26 - 0.013 = 7.247$
$(7.26 \times 10^6) - (1.3 \times 10^4) = 7.247 \times 10^6$

---

5. Answer: D) 2.72×10^8

$$\text{time} = \frac{\text{distance}}{\text{speed}} = \frac{5.062 \times 10^{13}}{1.86 \times 10^5}$$
$$= \frac{5.062}{1.86} \times 10^{13-5} \approx 2.72 \times 10^8 \text{ seconds}$$

---

6. Answer: B) 8.65×10^3

$1.46 \times 10^4 + 2.38 \times 10^4 = 3.84 \times 10^4$
$6.75 \times 10^3 = 0.675 \times 10^4, \quad 3.84 \times 10^4 + 0.675 \times 10^4 = 4.515 \times 10^4$
$\text{West} = 5.38 \times 10^4 - 4.515 \times 10^4 = 0.865 \times 10^4 = 8.65 \times 10^3$

Q6 | Lesson 2-1: Terminating and Repeating Decimals **Textbook p. 77**

1. Answer: A) -0.6875; terminating

$11 \div 16 = 0.6875$

the division ends (remainder 0), so the decimal terminates

$-\frac{11}{16} = -0.6875$

---

2. Answer: C) $0.\overline{15}$; non-terminating

$5 \div 33 = 0.151515\ldots$

the digits 15 repeat forever, so it is non-terminating

$\frac{5}{33} = 0.\overline{15}$

---

3. Answer: B) 4.375; terminating

$\frac{3}{8} = 3 \div 8 = 0.375$

$4\frac{3}{8} = 4.375$

the division ends, so it is terminating

---

4. Answer: D) $-9.3\overline{6}$; non-terminating

$11 \div 30 = 0.3666\ldots$

only the 6 repeats, so it is non-terminating

$-9\frac{11}{30} = -9.3\overline{6}$

Q7 | Lesson 2-1: Terminating and Repeating Decimals **Textbook p. 77**

9. Answer: D) $0.\overline{5}$

$5 \div 9 = 0.555\ldots = 0.\overline{5}$

---

10. Answer: B) 0.4375

$$7 \div 16 = 0.4375$$

---

11. Answer: C) $5\frac{2}{3}$

Let $n = 0.666\ldots$ then $10n = 6.666\ldots$

$10n - n = 6.666\ldots - 0.666\ldots \Rightarrow 9n = 6 \Rightarrow n = \frac{6}{9} = \frac{2}{3}$

$5.666\ldots = 5\frac{2}{3}$

---

12. Answer: A) $\frac{7}{26}$

A fraction in simplest form gives a terminating decimal only if its denominator has prime factors 2 and 5 o

$5,\ 50 = 2 \cdot 5^2,\ 32 = 2^5 \Rightarrow$ terminating

$26 = 2 \cdot 13 \Rightarrow 13$ is a different prime factor, so $\frac{7}{26}$ is non-terminating

---

Q8 | Lesson 2-2: Roots **Textbook p. 89**

1. Answer: C) 19

$$19^2 = 361$$
$$\sqrt{361} = 19$$

---

2. Answer: A) ± 1.4

$$1.4^2 = 1.96$$
$$\pm\sqrt{1.96} = \pm 1.4$$

---

3. Answer: D) $-\frac{3}{4}$

$$\sqrt{\frac{9}{16}} = \frac{\sqrt{9}}{\sqrt{16}} = \frac{3}{4}$$
$$-\sqrt{\frac{9}{16}} = -\frac{3}{4}$$

---

4. Answer: B) Cannot be simplified: no real number squared equals -441

A negative number has no real square root, because no real number squared gives a negative number.
$\sqrt{-441}$ cannot be simplified

Q9 | Lesson 2-2: Roots **Textbook p. 89**

5. Answer: A) $m = \pm 0.2$

$$m = \pm\sqrt{0.04}$$
$$0.2^2 = 0.04 \Rightarrow m = \pm 0.2$$

---

6. Answer: C) 7

$$7^3 = 7 \cdot 7 \cdot 7 = 343$$
$$\sqrt[3]{343} = 7$$

---

7. Answer: B) -8

$$(-8)^3 = (-8)(-8)(-8) = -512$$
$$\sqrt[3]{-512} = -8$$

---

8. Answer: D) 4.5 feet

$$s = \sqrt[3]{91.125}$$
$$4.5^3 = 4.5 \times 4.5 \times 4.5 = 20.25 \times 4.5 = 91.125$$
$$s = 4.5 \text{ feet}$$

---

9. Answer: D) 14

Square formation: rows $\times$ plants in each row $= 196$
$$x^2 = 196 \Rightarrow x = \sqrt{196} = 14$$

---

10. Answer: B) -0.3

$$p = \sqrt[3]{-0.027}$$
$$(-0.3)^3 = (-0.3)(-0.3)(-0.3) = -0.027$$
$$p = -0.3$$

Q10 | Lesson 2-3: Real Numbers **Textbook p. 99**

1. Answer: C) Irrational

10 is not a perfect square, so $\sqrt{10}$ is a non-terminating, non-repeating decimal
The negative sign does not change this: irrational.

---

2. Answer: A) Rational

$-\dfrac{3}{11}$ is a ratio of two integers: rational.

---

3. Answer: C) Rational

$0.\overline{3} = \dfrac{1}{3}$ (a repeating decimal): rational.

---

4. Answer: A) Rational

$\sqrt{81} = 9 = \dfrac{9}{1}$: rational.

---

5. Answer: D) Rational

$0 = \dfrac{0}{1}$: rational.

---

6. Answer: B) Irrational

$\sqrt{2}$ is irrational, and dividing it by 2 keeps it irrational: $-\dfrac{\sqrt{2}}{2}$ is irrational.

---

7. **Answer: A)** Irrational

7 is not a perfect square, so $\sqrt{7}$ is irrational.

---

8. **Answer: C)** Rational

$$\frac{\sqrt{2}}{\sqrt{2}} = 1 = \frac{1}{1}\text{: rational.}$$

Q11 | Lesson 2-4: Estimate Irrational Numbers **Textbook p. 109**

1. **Answer: B)** 11

$$11^2 = 121, \quad 12^2 = 144$$
$$125 \text{ is closest to } 121 \Rightarrow \sqrt{125} \approx 11$$

---

2. **Answer: D)** 7

$$7^2 = 49, \quad 8^2 = 64$$
$$55 \text{ is closest to } 49 \Rightarrow \sqrt{55} \approx 7$$

---

3. **Answer: D)** 4

$$4^3 = 64, \quad 5^3 = 125$$
$$70 \text{ is closest to } 64 \Rightarrow \sqrt[3]{70} \approx 4$$

---

4. **Answer: B)** 10

$$9^3 = 729, \quad 10^3 = 1000$$
$$923 \text{ is closest to } 1000 \Rightarrow \sqrt[3]{923} \approx 10$$

Q12 | Lesson 3-2: Equations with Variables on Each Side **Textbook p. 143**

1. Answer: C) 8 months

Let m = months.

$45 + 4m = 61 + 2m$

$2m = 16$

$m = 8$

---

2. Answer: A) 40 seconds

Let s = seconds.

$150 - \frac{1}{2}s = 120 + \frac{1}{4}s$

$30 = \frac{3}{4}s$

$s = 30 \cdot \frac{4}{3} = 40$

---

3. Answer: C) 8 pounds

Let w = weight in pounds.

$14 + 2.25w = 20 + 1.5w$

$0.75w = 6$

$w = 8$

---

4. Answer: A) 5 hours

Let h = hours.

$20 + 5.5h = 15 + 6.5h$

$5 = h$

$h = 5$

---

5. Answer: D) 8 games

Let g = games.

$15 - 0.75g = 13 - 0.50g$

$2 = 0.25g$

$g = 8$

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Q13 | Lesson 3-3: Solve Multi-Step Equations **Textbook p. 149**

1. Answer: B) $g = -2$

$$\begin{aligned} -g + 6 + 2g &= -4g - 4 \\ g + 6 &= -4g - 4 \\ 5g &= -10 \\ g &= -2 \end{aligned}$$

2. Answer: A) $x = 10$

$$\begin{aligned} -8 - x &= -6x + 12 + 3x \\ -8 - x &= -3x + 12 \\ 2x &= 20 \\ x &= 10 \end{aligned}$$

3. Answer: C) $x = 4.5$

$$\begin{aligned} 2.4 - 1.2x &= 20.5 - 3x - 10 \\ 2.4 - 1.2x &= 10.5 - 3x \\ 1.8x &= 8.1 \\ x &= 4.5 \end{aligned}$$

4. Answer: B) $y = 1.5$

$$\begin{aligned} 12 - 4y - 8 &= 4y - 8 \\ 4 - 4y &= 4y - 8 \\ 12 &= 8y \\ y &= 1.5 \end{aligned}$$

5. Answer: D) $n = 4$

$$-2+3n=\frac{1}{3}n+\frac{2}{3}n+6$$
$$-2+3n=n+6$$
$$2n=8$$
$$n=4$$

---

6. Answer: D) $x=-5$

$$x-1+3x=-3x-36$$
$$4x-1=-3x-36$$
$$7x=-35$$
$$x=-5$$

---

7. Answer: B) $q=-5$

$$q+2=-6q+3+8q+4$$
$$q+2=2q+7$$
$$-q=5$$
$$q=-5$$

Q14 | Lesson 3-5: Determine the Number of Solutions **Textbook p. 167**

1. Answer: C) No solution

$$4x-32+12=4x-18$$
$$4x-20=4x-18$$
$$-20=-18 \text{ (false)}$$
No solution.

---

2. Answer: A) Infinitely many solutions

$$6k-15=6k-24+9$$
$$6k-15=6k-15 \text{ (always true)}$$
Infinitely many solutions.

---

3. Answer: C) Infinitely many solutions

$$\frac{1}{3}(12y - 9) - 8y = 4y - 3 - 8y = -4y - 3$$

$-4y - 3 = -4y - 3$ (always true)

Infinitely many solutions.

---

4. Answer: A) No solution

$$18 - 30w = 20 - 10w - 20w$$

$18 - 30w = 20 - 30w$

$18 = 20$ (false)

No solution.

---

5. Answer: D) -5 and 70

$$2x - 7(x + 10) = 2x - 7x - 70 = -5x - 70$$

So the boxes are -5 and 70

---

6. Answer: B) 14 and 8

$$12x - x + 8 + 3x = 14x + 8$$

So the boxes are 14 and 8

---

7. Answer: A) $-12x + 7$

$-15x + 4x + 2 - x = -12x + 2$

Same coefficient (-12) but a different constant gives no solution: $-12x + 7$

---

8. Answer: C) $4x - 20$

$9(x - 4) - 5x = 9x - 36 - 5x = 4x - 36$

Same coefficient 4 but a different constant gives no solution: $4x - 20$

---

9. **Answer: B)** The coefficients are the same, and the constants are different.

$\frac{2}{3}(x+3) = \frac{2}{3}x + 2, \qquad \frac{2}{3}(x-6) = \frac{2}{3}x - 4$

Coefficients are the same ($\frac{2}{3}$), constants are different ($2 \neq -4$) so there is no solution.

Q15 | Lesson 4-1: Proportional Relationships and Slope **Textbook p. 189**

1. **Answer: D)** $\frac{1000}{3}$; about \$333 of sales per day

From the graph, the line passes through $(3, 1000)$ and $(6, 2000)$

$m = \frac{2000 - 1000}{6 - 3} = \frac{1000}{3} \approx 333$

About \$333 of book sales per day.

---

2. **Answer: D)** 33.75; it costs \$33.75 for each hour

$y = 33.75x$ is in the form $y = mx \Rightarrow m = 33.75$

It costs \$33.75 for each hour.

---

3. **Answer: B)** 2.3; the movie earns \$2.3 million each week

$y = mx: \quad 9.2 = m(4)$

$m = \frac{9.2}{4} = 2.3$

The movie earns \$2.3 million each week.

---

4. **Answer: C)** Panel B, because its slope 1,200 is greater

Panel A: slope $= 1{,}020$

Panel B: the graph passes through $(3, 3600) \Rightarrow m = \frac{3600}{3} = 1{,}200$

$1{,}200 > 1{,}020$, so panel B produces more power.

Q16 | Lesson 4-2: Slope of a Line **Textbook p. 203**

1. Answer: A) $\frac{1}{4}$

Use the points $(2, 0.5)$ and $(4, 1.0)$

$$m = \frac{1.0 - 0.5}{4 - 2} = \frac{0.5}{2} = \frac{1}{4}$$

---

2. Answer: C) -20

Use the points $(2, 80)$ and $(4, 40)$

$$m = \frac{40 - 80}{4 - 2} = \frac{-40}{2} = -20$$

---

3. Answer: A) $-\frac{4}{3}$

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-1 - 3}{2 - (-1)}$$
$$= \frac{-4}{3} = -\frac{4}{3}$$

Q17 | Lesson 4-2: Slope of a Line **Textbook p. 203**

4. Answer: D) -1

$$m = \frac{6 - 5}{2 - 3} = \frac{1}{-1} = -1$$

---

5. Answer: B) 0

$$m = \frac{2 - 2}{7 - (-3)} = \frac{0}{10} = 0$$

(horizontal line)

---

6. Answer: A) Undefined

$$m = \frac{-2 - 8}{6 - 6} = \frac{-10}{0}$$

Division by zero: the slope is undefined (vertical line).

---

1. Answer: C) $y = 8x$; each ticket costs \$8

From the graph: $(1, 8)$

$$k = \frac{y}{x} = \frac{8}{1} = 8$$

$y = 8x$; each ticket costs \$8.

---

2. Answer: B) $y = 65x$; the car travels 65 miles each hour

From the graph: $(3, 195)$

$$k = \frac{y}{x} = \frac{195}{3} = 65$$

$y = 65x$; 65 miles each hour.

---

3. Answer: D) $y = 2.55x$; one ream costs \$2.55

$$y = kx: \quad 5.10 = k(2)$$

$$k = 2.55$$

$y = 2.55x$; one ream costs \$2.55.

---

4. Answer: D) $y = \frac{3}{2}x$; $1\frac{1}{2}$ cups per serving

$$4\frac{1}{2} = \frac{9}{2}: \quad \frac{9}{2} = k(3)$$

$$k = \frac{9}{2} \div 3 = \frac{9}{6} = \frac{3}{2}$$

$y = \frac{3}{2}x$; $1\frac{1}{2}$ cups per serving.

---

5. Answer: B) $y = 62.5x$; the bus travels 62.5 miles each hour

$$k = \frac{93.75}{1.5} = 62.5$$

Check: $\frac{187.5}{3} = 62.5$

$y = 62.5x$; 62.5 miles each hour.

---

1. Answer: C) slope $\frac{1}{2}$, y-intercept -5

$$y = mx + b \Rightarrow y = \frac{1}{2}x - 5$$
$$m = \frac{1}{2}, \quad b = -5$$

---

2. Answer: A) slope 3, y-intercept -1

$$y = 3x - 1 \Rightarrow m = 3, \quad b = -1$$

---

3. Answer: C) $y = -\frac{1}{3}x + 4$

$$y = mx + b$$
$$y = -\frac{1}{3}x + 4$$

---

4. Answer: A) $y = \frac{3}{2}x - 3$

$$y = mx + b$$
$$y = \frac{3}{2}x + (-3) = \frac{3}{2}x - 3$$

---

5. Answer: D) $y = 4x - 2$

$$y = mx + b$$
$$y = 4x + (-2) = 4x - 2$$

---

6. Answer: B) $y = -x + 6$

$$y = mx + b$$
$$y = -1x + 6 = -x + 6$$

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5. Answer: B) Graph B: horizontal line through $(0, -3)$

The equation $y = -3$ means every point on the line has $y = -3$

This is a horizontal line through $(0, -3)$ with slope 0.

---

6. Answer: D) Graph D: vertical line through $(2, 0)$

The equation $x = 2$ means every point on the line has $x = 2$

This is a vertical line through $(2, 0)$.

SECTION B — FREE RESPONSE ANSWERS (Q21 – Q25)

Q21 | Lesson 1-4: Zero and Negative Exponents **Textbook p. 41**

1.

$$46^0 = 1$$

2.

$$w^0 = 1$$

3.

$$8^{-4} = \frac{1}{8^4}$$

4.

$$y^{-9} = \frac{1}{y^9}$$

5.

$$\frac{1}{d^6} = d^{-6}$$

6.

$$\frac{1}{10^5} = 10^{-5}$$

7.

$$9^4 \cdot 9^{-6} = 9^{4+(-6)} = 9^{-2}$$

$$9^{-2} = \frac{1}{9^2} = \frac{1}{81}$$

8.

$$y^{-9} \cdot y^{3} = y^{-9+3} = y^{-6}$$
$$y^{-6} = \frac{1}{y^{6}}$$

9.

$$\frac{x^{-8}}{x^{-12}} = x^{-8-(-12)} = x^{4}$$

10.

$$\frac{d^{-13}}{d^{-2}} = d^{-13-(-2)} = d^{-11} = \frac{1}{d^{11}}$$

11.

$$8^{-7} \cdot 8^{7} = 8^{-7+7} = 8^{0} = 1$$
$$10^{4} \cdot 10^{-4} = 10^{0} = 1$$
$$8^{-7} \cdot 8^{7} \cdot 10^{4} \cdot 10^{-4} = 1 \cdot 1 = 1$$

12.

n^{4}: simplified.

$\frac{1}{n^{-5}} = n^{5}$: not simplified (negative exponent).

$n^{6} \cdot n^{-8} = n^{-2}$: not simplified.

$n^{7} \cdot p^{8}$: simplified (different bases).

$\frac{1}{n^{3}}$: simplified.

Select: n^{4}, $n^{7} \cdot p^{8}$, $\frac{1}{n^{3}}$

Q22 | Lesson 2-1: Terminating and Repeating Decimals — Textbook p. 77

5.

$$\text{Let } n = 0.888\ldots \text{ then } 10n = 8.888\ldots$$
$$10n - n = 8 \;\Rightarrow\; 9n = 8$$
$$n = \frac{8}{9}$$

6.

$$\text{Let } n = 0.181818\ldots \text{ then } 100n = 18.1818\ldots$$
$$100n - n = 18 \;\Rightarrow\; 99n = 18$$
$$n = \frac{18}{99} = \frac{2}{11} \;\Rightarrow\; -0.\overline{18} = -\frac{2}{11}$$

7.

$$\text{Let } n = 1.555\ldots \text{ then } 10n = 15.555\ldots$$
$$10n - n = 14 \;\Rightarrow\; 9n = 14$$
$$n = \frac{14}{9} = 1\frac{5}{9} \;\Rightarrow\; -1.\overline{5} = -1\frac{5}{9}$$

8.

$$\text{Let } n = 4.4545\ldots \text{ then } 100n = 445.4545\ldots$$
$$100n - n = 441 \;\Rightarrow\; 99n = 441$$
$$n = \frac{441}{99} = \frac{49}{11} = 4\frac{5}{11}$$

Q23 | Lessons 2-3, 2-5: Real Numbers; Compare and Order — Textbook pp. 99, 121

9.

$\sqrt[3]{343} = 7$

7 is a natural number, so it is also whole, an integer and rational.

Select: Rational, Integer, Whole, Natural.

10.

$$\frac{7}{\sqrt{2}} = \frac{7\sqrt{2}}{2}$$

This cannot be written as a ratio of integers.

Select: Irrational.

11.

$$-\frac{7}{1} = -7$$

A negative integer is not a whole or natural number.

Select: Rational, Integer.

12.

True. Integers can be written as $\frac{n}{1}$, so they are rational.

An irrational number cannot be written as a ratio of integers, so no number can be both irrational and an

---

13.

True. Every integer n can be written as $\frac{n}{1}$, a ratio of two integers, so it is rational. Example: $-4 = \frac{-4}{1}$

Compare 1.

$$\sqrt{11} \approx 3.32 \quad (3.3^2 = 10.89,\ 3.4^2 = 11.56)$$
$$3\frac{2}{3} \approx 3.67$$
$$3.32 < 3.67 \ \Rightarrow\ \sqrt{11} < 3\frac{2}{3}$$

Compare 2.

$$\sqrt{3} \approx 1.73, \qquad \frac{\sqrt{10}}{2} \approx \frac{3.16}{2} = 1.58$$
$$1.73 > 1.58 \ \Rightarrow\ \sqrt{3} > \frac{\sqrt{10}}{2}$$

Compare 3.

$$\pi^2 \approx 9.87, \qquad \sqrt{93} \approx 9.64 \quad (9.6^2 = 92.16,\ 9.7^2 = 94.09)$$
$$-9.87 < -9.64 \ \Rightarrow\ -\pi^2 < -\sqrt{93}$$

Compare 4.

$$\sqrt{12} \approx 3.46, \qquad 320\% = 3.2$$
$$-3.46 < -3.2 \ \Rightarrow\ -\sqrt{12} < -320\%$$

Compare 5.

$$3\frac{1}{2} = 3.5, \quad \frac{10}{3} \approx 3.33, \quad \pi \approx 3.14, \quad \sqrt{13} \approx 3.61$$
$$\pi < \frac{10}{3} < 3\frac{1}{2} < \sqrt{13} \text{ (graph these four points on the number line)}$$

Q24 | Lesson 3-4: Write and Solve Multi-Step Equations Textbook p. 157

1.

Let l = length. Width $= 2l - 40\frac{3}{4}$

$P = 2l + 2w \ \Rightarrow\ 86.5 = 2l + 2(2l - 40.75)$

$86.5 = 6l - 81.5$

$168 = 6l$

$l = 28$ feet

2.

Yearbook: $12(1.5x + 2)$; Robotics: $14(x + 10.5)$

$12(1.5x + 2) = 14(x + 10.5)$

$18x + 24 = 14x + 147$

$4x = 123$

$x = 30.75$; admission to the waterpark is \$30.75.

3.

Arjun: $5t + 5(3.50) = 5t + 17.5$

Emilia: $2(5t) + 3(2.75) = 10t + 8.25$

Equation: $5t + 17.5 = 10t + 8.25$

$9.25 = 5t$

$t = 1.85$; each ticket costs \$1.85.

Q25 | Lesson 4-5: Slope-Intercept Form **Textbook p. 235**

7.

The line crosses the y-axis at $(0, -3) \Rightarrow b = -3$

Another point on the line: $(2, 1)$

$$m = \frac{1 - (-3)}{2 - 0} = \frac{4}{2} = 2$$

$y = 2x - 3$

8.

Starting distance 420 miles, decreasing by 65 miles each hour:

$b = 420, \quad m = -65$

$y = -65x + 420$

9.

$b = 30$ (when $x = 0$)

$$m = \frac{90 - 30}{2 - 0} = \frac{60}{2} = 30$$

$y = 30x + 30$ (check: $30(8) + 30 = 270$)

10.

$y = -\frac{3}{5}x + 8 \Rightarrow m = -\frac{3}{5}, \ b = 8$

True: slope is negative; the y-intercept is 8; the slope is $-\frac{3}{5}$

False: the slope is 8; the y-intercept is $-\frac{3}{5}$