Math Challenge I-C: Algebra

Answer Key

Areteem Institute

Chapter 1. Solving Equations

Quick Reponse Questions:

1.11: C

1.12: B

1.13: B

1.14: -4

1.15: 4

1.16: B

1.17: C

1.18: 5

1.19: 3.75

1.20: -9

Practice Questions:

1.21(a): 23

1.21(b): 2

1.22(a): Yes.

1.22(b): Yes.

1.23(a): $3a+4b+9$

1.23(b): $\frac{1}{4}s+\frac{1}{4}t-2$.

1.24: $s=6$

1.25: $x=8$

1.26: $p=18$

1.27: $w=4-t$.

1.28: 35

1.29: 8

1.30: \$250

Chapter 2. Solving Inequalities

Quick Reponse Questions:

2.11: Yes.

2.12: C

2.13: A

2.14: B

2.15: Yes.

2.16: 10

2.17: -4

2.18: D

2.19: B

2.20: D

Practice Questions:

2.21(a): All real x: $(-\infty, \infty)$

2.21(b): $x < 0$: $(-\infty, 0)$

2.22(a): $[-3, 6)$

2.22(b): $(4, \infty)$

2.23: $\left(\frac{27}{34}, \infty\right)$

2.24: $b \geq \frac{20}{3} - \frac{7}{3}a$

2.25: $(0, 40]$

2.26: At most 18 feet wide.

2.27: At least 5 hours and 20 minutes.

2.28: At least 166.

2.29: $-5 < p < 5$: $(-5, 5)$

2.30: $s < -9$: $(-\infty, -9)$

Chapter 3. Absolute Values

Quick Reponse Questions:

3.11: -1

3.12: 9

3.13: 0

3.14: C

3.15: C

3.16: 0

3.17: 0

3.18: 1

3.19: 7

3.20: 6

Practice Questions:

3.21(a): -1

3.21(b): 1

3.22(a): $x = 2, 14$

3.22(b): $x = -7, -1$

3.23(a): $\frac{-13}{7}, \frac{-5}{7}$

3.23(b): No solution

3.24(a): $-4 \leq x \leq 4$: $[-4, 4]$

3.24(b): $x < 1$ or $x > 5$: $(-\infty, 1) \cup (5, \infty)$

3.25(a): No solution

3.25(b): $\left(\frac{-55}{4}, \frac{-17}{4}\right)$

3.26: $x = -3, 3$

3.27: $x = 0$

3.28: $x = -12, -4, 4$

3.29: $x = 2$

3.30: All real x: $(-\infty, \infty)$

Chapter 4. Linear Functions

Quick Reponse Questions:

4.11: B

4.12: -2

4.13: 3

4.14: C

4.15: -2.5

4.16: D

4.17: B

4.18: A

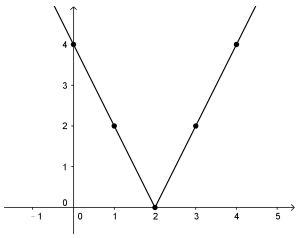
4.19: Yes.

4.20: C

Practice Questions:

4.21: A: Quadrant I, B: x-axis, C: Quadrant III , D: x-axis

4.22:



4.23(a): $\frac{4}{11}$

4.23(b): Undefined.

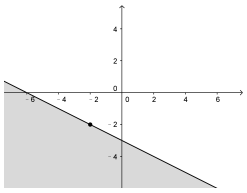
4.24: -1

4.25: $y = 2x+2$

4.26: $y-2 = -(x+2)$ or $y+2 = -(x-2)$

4.27: $-3x+y = 3$

4.28:



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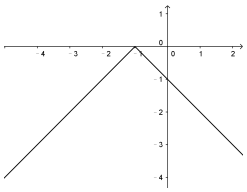

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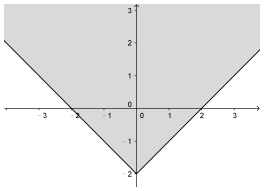


Chapter 5. Prob. Solving with Linear Functions

Quick Reponse Questions:

5.11: C.

5.12: D.

5.13: B.

5.14: D.

5.15: A.

5.16: D.

5.17: 96

5.18: 40

5.19: 21

5.20: B.

Practice Questions:

5.21(a): $4x+y=0$

5.21(b): $-4x+3y=12$

5.22: $y=x-1$ and $y=-x+1$.

5.23: $y=-\frac{1}{3}x+\frac{5}{9}$

5.24: Answers may vary.

5.25: $y=16$ or $y=100$.

5.26: 89.15

5.27: $y\geq -\frac{5}{6}x+\frac{200}{3}$

5.28: $y=-\frac{1}{2}x+5$

5.29: 675

5.30: 70%

Chapter 6. Systems of Equations

Quick Reponse Questions:

6.11: No

6.12: B

6.13: D

6.14: C

6.15: A

6.16: 7

6.17: 1

6.18: 5

6.19: -3

6.20: 2

Practice Questions:

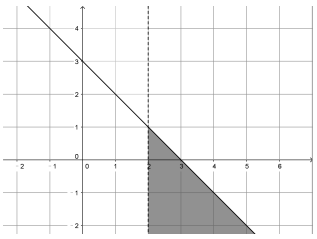
6.21: $(-1,1)$ and $(2,4)$

6.22: $(16,2)$

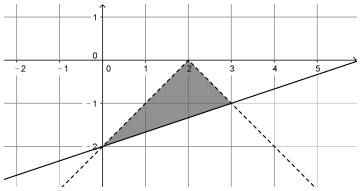
6.23: $(12,-8)$

6.24: $(600,500)$

6.25:



6.26:



6.27: $(2,4,3)$

6.28: $(2,5,-3)$

6.29: No solutions exist

6.30: $(100,0.5)$

Chapter 7. Prob. Solving with Systems

Quick Reponse Questions:

7.11: 12

7.12: 2

7.13: 7

7.14: 54

7.15: 6.5

7.16: C

7.17: A

7.18: D

7.19: 108

7.20: 40

Practice Questions:

7.21: $(-1, 1.25, 3)$

7.22: 20 red, 30 green, 30 blue

7.23: Ben: 10 days, Jack: 15 days

7.24: Stock A: $150, Stock B: $800, Stock C: $50.

7.25: Chickens: 20, Rabbits: 40

7.26: Starfish: 20, Beetles: 20, Crabs: 10

7.27: James: 1000, Paul: 500, Wade: 500, Anthony: 0

7.28: Rob to Jon is 1 : 2

7.29: No

7.30: 3 pounds

Chapter 8. Exponents and Radicals

Quick Reponse Questions:

8.11: 125

8.12: A

8.13: 9

8.14: D

8.15: B

8.16: 7

8.17: 10

8.18: 27

8.19: 1.5

8.20: C

Practice Questions:

8.21(a): $9x^6$

8.21(b): 25

8.22: $5\sqrt{10}$

8.23: $4y\sqrt{3xy}$

8.24: $2x^2y+6xy-2x^2$

8.25: $\sqrt{2}+2\sqrt{6}$

8.26: $x\sqrt{5}+5\sqrt{x}$

8.27: $\dfrac{36s^4t^4}{r^2}$

8.28: $\dfrac{2\sqrt{2x}-\sqrt{2}}{4}$

8.29: $\dfrac{\sqrt[3]{6}}{3}$

8.30: $\dfrac{\sqrt[3]{xy^2}}{y}$

Chapter 9. Problem Solving with Exponents

Quick Reponse Questions:

9.11: D

9.12: B

9.13: 6

9.14: C

9.15: A

9.16: 23

9.17: 10

9.18: C

9.19: 12

9.20: B

Practice Questions:

9.21(a): $11\sqrt{3}$

9.21(b): $x^3\sqrt{5}+5x^2+5x^2\sqrt{2}$

9.22(a): $4x^2-5x-6$

9.22(b): $2x^2y+y^2-6x^2-3y$

9.23: $4\sqrt{2}-2\sqrt{14}$

9.24: 7

9.25: $8+4\sqrt{3}$

9.26: $3\sqrt{2}+\sqrt{6}$

9.27: $\dfrac{r\sqrt{r}+2r+\sqrt{r}}{r-1}$

9.28: $\sqrt{2}+1$

9.29: 2

9.30: $x^2+2x+2x\sqrt{2}+2\sqrt{2}+3$