

Arithmetic Sequence Final Exam Review

1. Determine if the following are arithmetic sequences. If it is, write the values of a and d .

a. $\overset{5}{-1}, \overset{5}{4}, \overset{6}{9}, 15, \dots$ no

b. $\overset{11}{-32}, \overset{11}{-21}, \overset{11}{-10}, 1, \dots$ $a = -32, d = 11$

c. $\overset{8}{4}, \overset{8}{12}, \overset{8}{20}, 28, \dots$ $a = 4, d = 8$

2. Given the values of a and d , write the first 5 terms of each arithmetic sequence.

a. $a = -5, d = -3$ $-5, -8, -11, -14, -17$

b. $a = -24, d = 4$ $-24, -20, -16, -12, -8$

c. $a = 6, d = -2$ $6, 4, 2, 0, -2$

3. Find the value of the n th term of each arithmetic sequence.

a. $a = 9, d = 4, n = 18$
 $t_n = t_1 + (n-1)d$
 $t_{18} = 9 + (18-1)4$
 $= 9 + (17)4$
 $= 77$

b. $-10, -4, 2, \dots; t_{27}$
 $t_n = t_1 + (n-1)d$
 $t_{27} = -10 + (27-1)6$
 $= -10 + (26)6$
 $= 146$

c. $a = 32, d = -14, t_{41}$
 $t_n = t_1 + (n-1)d$
 $t_{41} = 32 + (41-1)(-14)$
 $= 32 + (40)(-14)$
 $= -528$

4. Write a general equation for the n th term of each arithmetic sequence.

a. $-2, 4, 10, 16, \dots$
 $t_n = t_1 + (n-1)d$
 $= -2 + (n-1)6$
 $= -2 + 6n - 6$
 $= 6n - 8$

b. $7, 3, -1, -5, \dots$
 $t_n = t_1 + (n-1)d$
 $= 7 + (n-1)(-4)$
 $= 7 - 4n + 4$
 $= -4n + 11$

5. Complete each statement

a. 553 is the ___th term of 4, 13, 22, ...

$$t_n = t_1 + (n-1)d$$

$$553 = 4 + (n-1)9$$

$$553 = 4 + 9n - 9$$

$$553 = 9n - 5$$

$$558 = 9n$$

$$62 = n$$

b. Find the number of term for -307 in the sequence 8, 3, -2, ...

$$t_n = t_1 + (n-1)d$$

$$-307 = 8 + (n-1)(-5)$$

$$-307 = 8 - 5n + 5$$

$$-307 = 13 - 5n$$

$$-320 = -5n$$

$$n = 64$$

Answer Key: 1. a) No b) yes, $a = -32$, $d = 11$ c) yes, $a = 4$, $d = 8$ 2. a) -5, -8, -11, -14, -17 b) -24, -20, -16, -12, -8 c) 6, 4, 2, 0, -2 3. a) 77 b) 146 c) -528
4. a) $t_n = 6n - 8$ b) $t_n = -4n + 11$ 5. a) 62 b) 64

Final Exam Review Prime Factorization

For each number below:

- a) Use a factor tree to find the prime factorization.
- b) Put answer in exponential form.
- c) Identify which of the numbers are perfect squares and/or perfect cubes. Justify your answer.

1) 20

```

    20
   / \
  2  10
     / \
    2  5
  
```

$2 \times 2 \times 5$
neither

2) 56

```

    56
   / \
  7  8
     / \
    4  2
     / \
    2  2
  
```

$2 \times 2 \times 2 \times 7$
neither

3) 72

```

    72
   / \
  9  8
 / \ / \
3 3 2 4
     / \
    2  2
  
```

$2 \times 2 \times 2 \times 3 \times 3$
neither

4) $1000 = 10^3$

```

    1000
   /  \
  10  100
 / \ / \
2 5 2 50
     / \
    5  10
       / \
      2  5
  
```

$(2 \times 2 \times 2 \times 5 \times 5 \times 5)$
 $2 \times 5 = 10$ cube

5) $144 = 12^2$

```

    144
   /  \
  12  12
 / \ / \
2  6 2  6
 / \ / \
2  3 2  3
  
```

$(2 \times 2 \times 2 \times 2 \times 3 \times 3)$
 $2 \times 2 \times 3 = 12$

6) $25 = 5^2$

```

    25
   / \
  5  5
  
```

(5×5)

7) 77

```

    77
   / \
  7  11
  
```

7×11
neither

8) 120

```

    120
   /  \
  4  30
 / \ / \
2  2 5  6
     / \
    2  3
  
```

$2 \times 2 \times 2 \times 3 \times 5$
neither

9) $64 = 4^3$ and 8^2

```

    64
   / \
  8  8
 / \ / \
2  4 2  4
 / \ / \
2  2 2  2
  
```

$(2 \times 2 \times 2 \times 2 \times 2 \times 2)$
 $\frac{1}{2} \quad \frac{1}{2} \quad \frac{1}{2} \rightarrow 8$

10) 450

```

    450
   /  \
  9  50
 / \ / \
3  3 5  10
     / \
    2  5
  
```

$2 \times 3 \times 3 \times 5 \times 5$
neither

11) $125 = 5^3$

```

    125
   /  \
  5  25
     / \
    5  5
  
```

$5 \times 5 \times 5$

12) $36 = 6^2$

```

    36
   / \
  6  6
 / \ / \
2  3 2  3
  
```

$(2 \times 2 \times 3 \times 3)$
 $2 \times 3 = 6$

Answer Key

1. $2 \times 2 \times 5$, no pairs or groups of three
2. $2 \times 2 \times 2 \times 7$, no pairs or groups of three
3. $2 \times 2 \times 2 \times 3 \times 3$, no pairs or groups of three
4. $2 \times 2 \times 2 \times 5 \times 5 \times 5$, perfect cube, can make 3 equal groups
5. $2 \times 2 \times 2 \times 2 \times 3 \times 3$, perfect square can make 2 equal groups
6. 5×5 , perfect square, can make two equal groups
7. 7×11 , no pairs or groups of three
8. $2 \times 2 \times 2 \times 3 \times 5$, no pairs of groups of three
9. $2 \times 2 \times 2 \times 2 \times 2 \times 2$, both, two equal groups and 3 equal groups
10. $2 \times 3 \times 3 \times 5 \times 5$, no pairs or groups of three
11. $5 \times 5 \times 5$, perfect cube, can make three equal groups
12. $2 \times 2 \times 3 \times 3$, perfect square, can make two equal groups

Name: _____

Date: _____

Financial Literacy Review

Show all work and don't forget to add all necessary units.

1. How much will you earn in a year as an apprentice metalworker if you are paid \$750 every two weeks?

$$750 \times 26 = \$19\,500$$

2. What is your annual salary if your monthly salary is \$3568?

$$3568 \times 12 = \$42\,816$$

3. As a medical technician, Cooper has been offered a job that pays \$53 000 per year and another job that pays \$25.50 per hour. Assuming a 40 hour work week and all other conditions being the same, at which job will he earn more?

$$25.5 \times 40 \times 52 = \$53\,040$$

2nd job makes slightly more

4. Dean works as a car salesman. He earns 8% commission on the after cost profit when he sells a car. If he sells a car for \$12 795 that cost the dealer \$9280, how much does he make?

$$12\,795 - 9\,280 = \$3\,515$$

$$3\,515 \times 0.08 = \$281.20$$

5. Nathan earns \$12.42/h, but earns double time and a half when he works on a statutory holiday. If he works a 6 hour shift on a holiday, how much will he earn that day?

$$12.42 \times 2.5 \times 6$$
$$\$186.30$$

6. Kayleigh made \$20.55 commission on a \$685 sale. What was her rate of commission?

$$\frac{x}{100} = \frac{20.55}{685}$$
$$x = 3$$

3%

7. Sam works 40 hours regular time at \$18.25 and 5.25 hours overtime at time and a half. How much does she earn?

$$40 \times 18.25 = \$730$$
$$5.25 \times 18.25 \times 1.5 = \$143.72$$

$$\$873.72$$

8. Kayla crochets scarves and sells them for \$15.95 each. If material costs her \$7.52/scarf, how much does she make if she sells 9 scarves?

$$15.95 - 7.52 = \$8.43$$

$$8.43 \times 9 = \$75.87$$

9. Cole bids \$5750 for a contract. If he hires 4 men for 2 days (8h/day) at a rate of \$12.50/h and his materials cost him \$1675.84, how much does he earn?

$$\begin{array}{r} 4 \times 2 \times 8 \times 12.50 = 800 \\ + 1675.84 \\ \hline \$ 2475.84 \end{array}$$

$$\begin{array}{r} 5750 \\ - 2475.84 \\ \hline \$ 3274.16 \end{array}$$

10. How much CPP will be taken off your \$782.45 taxable income at 4.95%?

$$782.45 \times 0.0495 = \$38.73$$

11. Meghan has been offered isolation pay of \$125/week to work as a park ranger in northern Alberta.

- a. How much will she make in a 40 hour work week if she is normally paid \$21.52/h?

$$\begin{array}{r} 40 \times 21.52 = 860.8 \\ + 125 \\ \hline \$ 985.80 \end{array}$$

- b. Adding in the isolation pay, what is her hourly rate?

$$\frac{985.80}{40} = \$24.65/\text{hr}$$

12. Max sells peanuts at BC Lions football games. He earns \$30/game plus \$0.15 for each bag he sells. He averages about 350 bags sold per game. How much will he earn over the 8 games he works during the season?

$$\begin{array}{r} 0.15 \times 350 = \$52.50 \\ + 30 \\ \hline \$82.50 \end{array}$$

$$82.5 \times 8 = \$660$$

13. Taylor works 40h/week earning \$12.35/h. Her deductions are as follows: EI \$8.54, CPP \$24.45, Income Tax \$74.10, Union Dues \$5.20. Determine her total deductions and her weekly net income.

$$\begin{array}{r} 8.54 \\ 24.45 \\ 74.10 \\ 5.20 \\ \hline \$112.29 \end{array}$$

$$12.35 \times 40 = 494$$

$$494 - 112.29 = \$381.71$$

Answer Key:

1. \$19 500 2. \$42 816 3. 2nd job 4. \$281.20 5. \$186.30 6. 3% 7. \$873.72 8. \$75.87
9. \$3274.16 10. \$38.73 11. a) \$985.80 b) \$24.65 12. \$660 13. Deductions \$112.19, Net
Income \$381.71